

**THE
RAILWAY GAZETTE**

A Journal of Management, Engineering and Operation
INCORPORATING

Railway Engineer • TRANSPORT • The Railway News
The Railway Times • Herapaths Railway Journal • RAILWAY RECORD.
RAILWAYS • ESTABLISHED 1835 • RAILWAY GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.

Telephone : WHITEhall 9233 (12 lines). Telegrams : "Trazette Parl, London"

BRANCH OFFICES

GLASGOW: 87, Union Street Central 4646
NEWCASTLE-ON-TYNE: 21, Mosley Street Newcastle-on-Tyne 22239
MANCHESTER: Century House, St. Peter's Square Central 3101
BIRMINGHAM: 90, Hagley Road, Edgbaston Edgbaston 2466
LEEDS: 70 Albion Street Leeds 27174
BRISTOL: 8, Upper Berkeley Place, Clifton Bristol 21930

Annually £4 10s. by post.

Single copies, Two shillings.

Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor : B. W. C. Cooke, Assoc. Inst. T.

Vol. 101]

FRIDAY, SEPTEMBER 3, 1954

[No. 10

CONTENTS

	PAGE
Editorial Notes	253
The Indian Railway Board	255
The Railways of Norway	256
Developments in Traction Rectifiers	256
Letters to the Editor	257
Publications Received	258
The Scrap Heap	259
Overseas Railway Affairs	260
A Paradox of Modern Railway Management—3	262
Electric Traction Section	263
East African Reconstructed Rolling Stock	266
The Norwegian Railway Centenary	267
Personal	271
News Articles	273

Appointments to the British Transport Commission

THE appointment by the Minister of Transport & Civil Aviation, Mr. John Boyd-Carpenter, of Mr. A. B. B. Valentine as a full-time and of Lt.-Col. D. H. Cameron of Lochiel as a part-time Member of the British Transport Commission brings the strength of that body up to a Chairman, Sir Brian Robertson, and 11 other Members; six of the latter now will be whole-time. The Transport Act of 1953 increased the maximum number of Members, including the Chairman, from nine, under the Act of 1947, to 15, so that the Minister can appoint a further three. The Act of 1953, besides paying special regard to Scotland in providing, in the reorganisation of British Railways, for an authority ("area") for the whole of that country, also enjoins that the Commission shall include two Members nominated after consultation with the Secretary of State for Scotland as being "likely to be conversant with the circumstances and special requirements of Scotland." The appointment of Lt.-Colonel Cameron of Lochiel seems the first to have been made under this provision since the Act was passed last year, though some existing Members are versed in Scottish affairs. Mr. Valentine, as the Member of the London Transport Executive specially charged with commercial and operating matters, has wide experience of the commercial aspects of passenger traffic in and around

London, in which he has collaborated closely with British Railways, notably in preparing and presenting charges schemes, and, as a former Operating Manager (Railways) of London Transport, of passenger train operation. The new appointments shed no light on Government intentions, apart from the reorganisation of British Railways under the 1953 Act, as to the future of nationalised transport and more particularly to that of the London Transport Executive. Two more Members can hardly be the first of the "major changes in the structure and organisation" of the Commission which Mr. Boyd-Carpenter's predecessor, Mr. Alan Lennox-Boyd, gave as a reason for re-appointing for a term of only one year the Chairman, Sir John Elliot, and the other Members of the London Transport Executive. Until the proposals for railway reorganisation have been approved by Parliament, the Minister is unlikely to make new appointments to the Commission; but there is no reason against his lengthening the tenure of the Members of London Transport Executive. This will now consist for the time being of the Chairman and four other Members, the statutory minimum.

A Subsidy for the Railways?

THE three railway unions have been making efforts to achieve a solution of the apparent wages deadlock. The National Union of Railwaymen and the Transport Salaried Staffs' Association have asked for further meetings with the Chairman of the British Transport Commission, Sir Brian Robertson. The Associated Society of Locomotive Engineers & Firemen is taking the dispute to arbitration, which may take some time, the first stage being the Railway Staff National Council. This is far better than rash talk of strike action, so far mentioned only by some N.U.R. and A.S.L.E.F. local committees. There may be, however, in the minds of the unions some hope that the difference of £12,000,000 or more between the additional cost to the Commission in a full year of what it has offered in the form of a revised wages structure and that of the N.U.R. demands, might be met by a subsidy. Whether this be an open or a hidden subsidy cannot alter the fact that it would be objectionable on any grounds. Not the least of these would be the removal of one of the chief incentives to efficiency. Whatever course the wages negotiations take, concession to the union demands resulting in a subsidy would be a most undesirable solution.

Eastern Region Winter Passenger Services

DURING the period of the winter timetable of British Railways, Eastern Region, it is hoped to introduce some of the new diesel railcar units on services in Lincolnshire, though presumably no appreciable accelerations will be possible until the full complement of diesels is available for these services. The "Elizabethan" (Kings Cross—Edinburgh non-stop) is being withdrawn with other summer season trains. The cross-country trains between Liverpool Central and Harwich Parkeston Quay, in connection with the Harwich—Hook of Holland night sailings, are being accelerated, which should help to increase the attraction of this route to the Continent. Improvements to local services include small cuts in the schedules of all trains between Liverpool Street and Enfield Town; it is hard to see how this can win back traffic, but better use of train crews, motive power, and rolling stock should result in considerable economies. Preliminary engineering work for electrification beyond Shenfield to Chelmsford and Southend Victoria, estimated to be completed in 1957, will slow train services over the Colchester main line this winter by up to 5 min. compared with last year.

The Barsi Light Railway

THE Barsi Light Railway was taken over on January 1 by the Indian Government, but only part of the purchase money has yet been paid. Mr. P. H. Maffin, Chairman of the Barsi Light Railway Co. Ltd., told stockholders at the sixtieth ordinary general meeting last week that after a payment on account of £450,000 in January,

authority for the payment of £525,000 on account of the balance of the money was countermanded by India pending the settlement of a claim for compensation on the grounds of "retrenchment," made by former employees under an Act of 1953 and in spite of an agreement reached between the company and the Railway Board. The claim has gone before a local civil court, but Mr. Maflin could not say when it would be settled or whether the present prohibitory order might be relaxed to allow another instalment of the purchase price to be paid. Meanwhile the Indian Government has offered to pay £425,000 as the balance of the money when the order is lifted, and negotiations are in progress. The Chairman deplored that a company which had given more than 56 years of efficient service with but moderate rewards to its stockholders should be subjected to such difficulty and delay, which were preventing the company from going into liquidation.

Overseas Railway Traffic

SOUTH African Railways & Harbours railway receipts showed little fluctuation throughout July, the lowest figure being £2,250,042 for the week ended July 10 and the highest £2,374,474 for the week ended July 3. This compared with minimum and maximum receipts of £1,907,262 and £2,076,108 during the corresponding period of 1953. Comparison of weekly averages for the year up to July 31 gives figures of £2,272,435 and £1,973,101 for 1954 and 1953 respectively, and the corresponding aggregates are £39,728,790 and £34,494,545. Harbours and airways also show considerable aggregate increases over last year. Taltal receipts for June were pesos 4,744,000, an increase of pesos 1,646,000 compared with June of last year. In July receipts rose to pesos 5,537,000, compared with pesos 3,220,000 in July, 1953, giving an increase of pesos 2,317,000. Aggregate receipts at the end of June, for 12 months, were pesos 50,322,000, an increase of pesos 17,439,000 over the previous year.

Increasing the Productivity of the S.N.C.F.

THE postwar modernisation programme of the French National Railways has reached a point where it is possible to survey clearly the results achieved. Some of the most significant are presented graphically in a booklet entitled "Activité et Productivité de la S.N.C.F. 1948-1953," which has an introduction by Monsieur Pierre Tissier, President, and Monsieur Louis Armand, Director-General, of the S.N.C.F. Many political and economic factors to which other forms of transport are not subject affect the system and make it impossible for it to function without a State subsidy. Nevertheless, as the statistics indicate, great efforts have been made to increase productivity. Although the number of staff has fallen from about 475,000 in 1948 to about 400,000 in 1953, the traffic units (passenger-miles and ton-miles combined) per man-hour have risen from 68 to 80. Locomotives have dropped in number from 12,500 to 9,500, and the increase in electric and diesel traction has brought about a much more intensive use of motive power. The wagon pool has been reduced from 440,000 to 390,000, but the figure of ton-km. per wagon has gone up from 95,000 to 109,000, achieved by a more rapid turnaround and the use of wagons of greater capacity.

A Midland Enterprise

THE port of Heysham, which this week celebrates the fiftieth anniversary of its opening, was a creation of the Midland Railway and was built to replace Morecambe as the base for the company's long-established steamer service to Belfast. Morecambe had become inadequate for the larger ships being introduced and it was decided to use the great depression in Morecambe Bay known as Heysham Lake as a deep-water approach to an artificial harbour. Today Heysham is one of the busiest of Lancashire's smaller ports, with a spacious, sheltered tidal basin of 36 acres, and its general cargo tonnage is nearly 2,000,000

tons imported and 1,400,000 exported. The port was inaugurated on September 1, 1904, two new cross-Channel vessels *Antrim* and *Londonderry* superseding the paddle steamers which had operated from Morecambe. In 1928 the L.M.S.R. replaced them by the *Duke of Argyll*, *Duke of Lancaster* and *Duke of Rothesay*, which are themselves now to give way to three new vessels ordered by British Railways at a cost of £4,000,000. Heysham was associated early in its existence with another Midland venture when the Lancaster-Morecambe-Heysham line was electrified at 6,600 volts a.c. 25 cycles, in 1908, now converted to operation at 50 cycles and the first electrified line in Britain to be supplied at the industrial frequency.

Visual Indication at Euston Train Arrival Bureau

IN conjunction with the recent provision of the permanent train describers in the Euston Station signalbox, visual indication of the approach of trains running into four arrival platforms, Nos. 1, 2, 3, and 6, has been installed in the train arrival bureau at Euston, London Midland Region. The procedure for supplying information to the arrival bureau is by teleprinter from the Willesden telegraph office, supplemented by telephonic advice from the Euston Station signalbox of the number of the platform. In addition, it was formerly the practice for a telephonic intimation to be given from the station signalbox that the train was approaching the station, to enable the operator to insert, at the appropriate time, the slide indicating that the train had arrived. The new equipment includes an indicator fitted with four lamps and four plungers designated to indicate the platform with which each is associated. The approach of passenger trains on either the up fast or up slow line, when approximately 160 yd. on the Camden side of Euston Station Signalbox, lights the indicator lamp associated with the platform into which the train is routed, and a buzzer sounds. The indication is cancelled and the buzzer silenced by the operator pressing the appropriate plunger. The visual indicators constitute a decided improvement on the telephonic advice, and also reduce the telephoning by the station signalbox staff.

Intermediate Speeds in Multiple-Unit Stock

WITH the usual type of series-parallel control of a multiple-unit train, conditions may arise in which the speeds in full series and full parallel are respectively below and above what is required. Motormen may be instructed in such circumstances to coast, making brief applications of power at intervals so as to maintain the desired speed. Sometimes the rule is that the controller must be moved right round to parallel at each application. The provision of weak-field notches in series to give intermediate speeds is unusual in multiple-unit stock, but it has been considered justified in the latest two-coach sets on the South-Eastern Region of the French National Railways, which make fairly lengthy outer-suburban journeys over electrified main lines. In these vehicles the weak-field notch in series permits speeds up to about 8 m.p.h. above those in full field. In addition hand notching can be used up to the series position, so that instead of a single shunting notch there are actually nine resistance notches that can be selected for short periods, although this facility is used mainly for shunting or for starting in difficult conditions.

Coal Traffic by Pipeline

THE coal traffic of British Railways, for which road transport and coastal shipping already compete, may suffer further depredation if proposals for a coal-carrying pipeline from Birmingham to London are implemented. The carriage of water-suspended solids by pipeline is by no means a new conception, and experiments have been carried on for some time; but the scheme now proposed would move coal on a considerable scale, probably some 5,000,000 tons a year. The coal would be in small pieces suitable for use in power stations. It is evident that if small coal only can be carried in this manner the scope for

pipelines will be limited and coastal shipping might be chiefly affected as conveying much of the coal for electric generating stations. Advances in the technique of fluidisation may, in time, enable larger coal to be carried. This project, like those for building pithead power stations and for underground gasification of coal, seems to point to a change in the basic pattern of coal traffic, which today provides British Railways with one-quarter of their receipts.

A Load Not Properly Secured

WHAT might have been a most serious accident occurred at Longniddry Junction on December 17, 1953, when part of a load of Decauville track items, not secured adequately in accordance with rule, fell from a freight train in the path of a parcels train travelling at 60 m.p.h., the driver of which, who received serious injuries, had no warning of the obstruction. The locomotive, separated from its tender, came to rest upside down at the bottom of an embankment. The fireman was killed. The freight train guard had made unavailing efforts to attract his driver's attention as soon as he observed something was wrong—the load was next to his van—and also that of the Longniddry signalman, but the train was not stopped until the next station under the "stop and examine" signal. As will be seen from the summary of Colonel D. McMullen's report in this issue, the roping of the wagon was not properly done. It was doubtful if the condition of the roping was as firm as some who professed to have examined it during the journey maintained. New methods and instructions for handling this important type of work are being prepared incorporating greater safeguards.

Diesel Suburban Service

FOR many years the suburban services out of Perth on the Western Australian Government Railways were handled by tank engines of the unusual 4-4-4T wheel arrangement. Recently short-time trials were made with one of the Paxman-engined 410 b.h.p. diesel-electric locomotives, but this was merely a preliminary to the introduction of diesel-mechanical railcars from Craven of Sheffield. Of the total order for 22 single-unit railcars of 250 b.h.p. and 30 tons weight, 18 have been fitted out to suit the suburban services, and the remaining four for up-country traffic. The suburban cars have 62 seats, room for about 48 standing passengers, and a small amount of luggage space. New timetables are to be introduced to give these cars full scope in recapturing suburban traffic lost to road transport, with more frequent services, quicker schedules, more stopping places, a more flexible method of collecting fares, and adequate publicity.

Another Steam Turbine Locomotive

A FURTHER example of locomotive propulsion by steam turbine is the new steam-turbine-electric locomotive delivered by the Baldwin-Lima-Hamilton locomotive works at Eddystone, Pa., earlier this summer to the Norfolk & Western Railway. Alone among major American railways not to adopt the diesel-electric locomotive, the N. & W. is a particularly suitable field for such an experiment, in which Westinghouse Electric and Babcock & Wilcox have collaborated with the builders. The last-mentioned company has designed a water-tube boiler, producing steam at 600 lb. pressure and 900° F. temperature, which burns coal on a travelling grate with continuous ash removal and maintains the full pressure automatically between idling and full load. Including a 12-wheel tender carrying 22,000 gal. of water, this enormous machine, supported on four six-wheel bogies with all twelve axles motorised, is 161 ft. 2 in. long and weighs no less than 523 tons (of 2,240 lb.) in full running order. It is rated at 4,500 h.p., and has a maximum tractive effort of 175,000 lb. and a continuous effort of 144,000 lb. at 9 m.p.h. At the front end is a coal hopper accommodating 20 tons; next comes the driving cab; and after that the boiler, with the turbo-generator at the rear.

The Indian Railway Board

THE Government of India is understood to be considering the reconstitution of the Railway Board. The tenure of the present members of the Board is due to expire in the next few months and the change is likely to be brought about when new members are appointed. It is expected that the reconstitution will be more a readjustment of functions and powers of members, with wider powers vested in the Chairman, than a substantial alteration in the structure of the Board itself.

The genesis of the Railway Board may be said to have been the formation in 1874 of a State Railway Directorate in the Central Government as an expression of the increasing direct participation of the State in railway building. The Directorate was subsequently headed by a central Director-General of Railways, who later gave place to a full Secretary to the Government of India. Sir Thomas Robertson in the report of his inquiry into the administration and operation of Indian railways at the beginning of this century, advocated setting up a board, with a Chief Commissioner and two other Commissioners. As a result the first Indian Railway Board, consisting of a Chairman and two members, and subordinate to the Department of Commerce & Industry, was appointed in 1905. This in 1908 became a separate Railway Department, and its head was designated the President and received enhanced powers. In 1922-24, in accordance with the recommendations of the Acworth Committee, the President was designated Chief Commissioner for Railways, a Financial Commissioner was appointed, and a third member was subsequently included. By the middle of 1925, the East Indian, Great Indian Peninsula, North Western, and Eastern Bengal Railways were owned by the State. The railway budget had already been separated from the general budget, paving the way for the separation of the accounts from the audit within the Railway Board.

The existing pattern of the Board was retained some time after India became independent, until, in fact, its present composition was adopted in April, 1951. The Board is headed by three Members, responsible for engineering, transportation, and staff respectively, and a financial commissioner; the Member for Engineering is also both Chairman of the Board—an office which replaces that of the former Chief Commissioner of Railways—and *ex officio* Secretary to the Ministry of Railways. This functional organisation was alluded to as an all-India Railway Executive by the then Minister of Transport & Railways, Mr. Gopalaswami Ayyangar, when introducing the railway budget in 1951. He explained also that the Board would function as a corporate body advising him on major policy matters and issuing executive orders for the administration of the various railways. This partial reorganisation of the Railway Board, he claimed, would cut down the total establishment charges by 16 per cent.

An onerous task which fell at once to the lot of the reconstituted Railway Board was the reorganisation of the railways of India on a zonal or regional basis. Six systems were formed, each with a general manager; the regrouping was carried out with remarkable speed and was completed in April, 1952. In 1951 the Government of India launched a five-year plan providing for a total expenditure of Rs. 2,069 crores, of which Rs. 400 crores were for allotment to the railways, which had been greatly deprived of equipment during the war, to enable them not only to regain but also surpass their former position and cope with a much increased goods and passenger traffic. The progress of this project is satisfactory and there is no reason why the full allotment should not be absorbed. The railways are now looking forward to a second Five-Year Plan to open up a period of development. One aspect which is now receiving the close attention of the Board is the improvement of amenities for the travelling public, and it has agreed to appoint on each railway an officer of administrative rank to be solely in charge of the arrangements. The proposed changes in the Board no doubt are designed largely to facilitate execution of the Five-Year Plan.

The Railways of Norway

THE building of railways through terrain as difficult and with such an extreme winter climate as that traversed by nearly all the lines which today form the Norwegian State Railways would be a series of engineering feats of which any country could be proud. In the case of Norway, where the State Railways are celebrating their centenary this week, there must be in this country, besides the gratification shared with a country with which Britain has so much in common, pride in the part played by British enterprise and technical skill. Generous reference to this part as well as to the magnificent work of his own countrymen is made by Mr. H. E. Stokke, General Manager of the Norwegian State Railways, and well known to many railway officers and others concerned with transport in Britain, in an article elsewhere in this issue on the origin and development over 100 years of the system of which he is the chief. The close ties between the two countries, to which Mr. Stokke alludes, are shown by the presence at the centenary celebrations of Sir Reginald Wilson, Member of the British Transport Commission.

Largely because of financial and physical difficulties in railway building, Norway has been late in completing her main railway routes. Thus the Oslo-Bergen line was not opened until 1909, and through running between the capital and Stavanger was only made possible during the last war. The only railway access from most districts of Norway to the port of Narvik is through Swedish territory. Work now is in progress on an important line northwards from Trondheim to Bodø in the far north of the country—an example, comparatively rare in Europe today, of new railway construction to open up the territory served.

In mechanical as in civil engineering Norwegian railwaymen have shown themselves both skilful, and, in view of the restricted financial resources at their disposal, as advanced in the application of new techniques in steam, diesel, and electric traction as their colleagues in countries with greater opportunities. This is manifest in the design of steam locomotives and in the development of diesel trains and railcars for passenger traffic.

In view of the extensive electrification of railways in Sweden, which is sparsely populated, devoid of coal, and endowed with natural water-power resources, it is sometimes asked why Norway, where conditions are similar, has not electrified her railways to the same extent. In fact, a large proportion of the traffic of the Norwegian State Railways is electrically hauled today, though not to the same extent as in Sweden. Furthermore, Norway was a pioneer, from the 1890s onwards, in railway electrification, to which there have been, and still are, grave impediments. The distribution of population and industry, with even vaster areas of undeveloped country than in Sweden, is not conducive to the rail traffic densities which justify electrification. The country as a whole has been without extensive heavy industry, so that much plant has been obtained abroad. The depression of the 1930s, and then the war, further impeded progress. Now, however, with the increased difficulty of obtaining coal from abroad, a bold project is being executed for electrification of the main lines, and thereafter further electrification of secondary lines is planned.

Developments in Traction Rectifiers

DIRECT current electric traction owes its present position very largely to the pumpless mercury arc rectifier and the improvement of methods for the remote supervisory control of substations. Since the first sealed steel tank rectifiers for traction were installed in 1936, the exigencies of railway service have necessitated special attention to compact design and easy handling of units. British manufacturers have made considerable progress in these directions with multi-anode designs. The development of single-anode traction rectifiers, to which reference was made in our August 6 issue, undoubtedly simplifies problems of layout and access in some circumstances, but this is not

necessarily the reason for their use on railways. The predominance of large single-anode units for heavy-current duties which is characteristic of American practice at the present time results primarily from the choice of such types to meet the heavy wartime demands of electro-chemical plants.

Where large-capacity multi-anode installations are concerned, it is general practice to subdivide the rectifiers by connecting a number of medium-size multi-anode tanks in parallel. The B.T.H. rectifiers for the Gippsland electrification of the Victorian Railways are representative of what can be achieved today with the pumpless steel tank type in the way of reducing the weight and dimensions of single units. Here the 1,500 kW. rectifier units each consist of two six-anode tanks housed in cubicles mounted on wheels to facilitate replacement. At certain substations two units are installed. The dimensions of a cubicle are 7 ft. high, 4 ft. 6 in. deep, and 3 ft. 2 in. wide, and its weight is about 17 cwt., so that a 1,500-kW. rectifier weighs about the same in hundredweights as an equivalent rotary converter in tons.

Another recent example of rectifiers and their associated equipment being adapted to substation buildings of simple design has been at the Surrey Docks substation of the London Transport Executive. In this installation the G.E.C. 1,000 kW. units consist of two six-anode cylinders, each with its own transformer mounted at the rear so that the end of the transformer case forms the back wall of the rectifier cubicle. Each cylinder is mounted on a wheeled truck above its auxiliaries so that it can be withdrawn readily from its cubicle after disconnecting a few external leads. Another method of combining transformers with rectifiers is seen in the glass bulb installation at the London Transport Bond Street substation, where the transformers occupy the base compartments of the equipment. The four Hackbridge & Hewitt 1,000 kW. rectifier equipments each consist of two self-contained 500-kW. units. In replacing the former rotary converters at this substation, they have permitted higher rating and increased overload capacity, while allowing more room in the building to accommodate new d.c. switchgear and supervisory control apparatus.

At this stage it might be premature to assess the possibilities of semi-conductors as traction rectifiers. It may be recalled, however, that a 300-kW. germanium unit has been in use at the Rugby works of the British Thomson-Houston Co. Ltd. since last December. Ratings of this category at least encourage speculation on the form to be taken by the power conversion apparatus of the future, whether installed in substations or in the locomotives and motor coaches themselves.

British Transport Commission Traffic Receipts

B RITISH Railways passenger receipts for Period 8, the four weeks ended August 15, were £2,369,000 more than in Period 7, but £427,000 below those for the corresponding period of last year, when there was a rise of £3,167,000 between the two periods. No doubt much of this fall in anticipated traffic is due to the exceptionally poor weather this summer, which has discouraged pleasure travel.

Merchandise and livestock figures fell to £6,713,000, the lowest level for some time. Some fall was to be expected in this period—last year it was £1,511,000—but the fall of £1,983,000 from Period 7 this year leaves the total £115,000 below that for the corresponding period of 1953 and is the first time since Period 2 that this traffic has not exceeded that recorded last year. The same is true of the figures for mineral traffic, which show a decrease of £128,000 compared with last year and have fallen by £730,000 from the Period 7 figure of £3,500,000. This tendency for mineral traffic to fall was noted in Period 7. There was a similar, but smaller, tendency in 1953, and it may be that this traffic, and coal class traffic, has been affected by the closing of works for summer holidays. The reduced summer coal prices have also ceased to have effect. Coal class figures, although much below those for Period 7, show an increase

of £389,000 over those for the similar period last year. Receipts from parcels, and so on, continue to be satisfactory, showing an increase of £193,000 on last year and an aggregate increase for the 32 weeks of £1,106,000. Collection and delivery services continue the falling trend noted previously, but are £30,000 above the 1953 figure.

London Transport railways receipts rose by £12,000 from Period 7 and appear to be returning to the expected level above receipts for 1953. The road service figures show a less satisfactory trend, and although £76,000 above those for last year do not match the more substantial increases recorded earlier in the year.

	Four weeks to August 15		Incr. or decr.	Aggregate for 32 weeks		Incr. or decr.
	1954	1953		1954	1953	
	£000	£000	£000	£000	£000	£000
Passengers—						
British Railways ...	13,972	14,399	— 427	73,105	72,172	+ 933
London Transport—						
Railways ...	1,417	1,356	+ 61	11,400	11,045	+ 355
Road services ...	4,014	3,938	+ 76	31,204	30,180	+ 1,024
Provincial & Scottish Buses ...	5,287	5,190	+ 97	31,250	30,303	+ 947
Ships ...	1,169	1,099	+ 70	3,644	3,443	+ 201
Total Passengers ...	25,859	25,982	— 123	150,603	147,143	+ 3,460
Freight, parcels & mails—						
British Railways—						
Merchandise & Livestock ...	6,713	6,828	— 115	67,423	65,457	+ 1,966
Minerals ...	2,770	2,898	— 128	27,697	27,372	+ 325
Coal & Coke ...	6,454	6,065	+ 389	69,403	65,424	+ 3,979
Parcels, etc., by passenger train ...	3,149	2,956	+ 193	24,492	23,386	+ 1,106
Total British Railways ...	19,086	18,747	+ 339	189,015	181,639	+ 7,376
British Railways C. & D. Others * ...	881	851	+ 30	7,460	7,125	+ 335
	5,031	5,731	— 700	49,501	50,914	— 1,413
Total freight, parcels and mails ...	24,998	25,329	— 331	245,976	239,678	+ 6,298
TOTAL ...	50,857	51,311	— 454	396,579	386,821	+ 9,758

* Inland waterways, freight haulage, and ships

Provincial and Scottish buses, at £5,287,000, show a gain of £97,000 over the corresponding period of last year and of £684,000 over Period 7. This compares with a gain of £719,000 between the corresponding periods of 1953.

Passenger shipping figures—the division as between Continental and other services is not shown—once again show a marked increase over the previous year, and have made an excellent recovery after a poor start to the year. The aggregate gain on 1953 is now £201,000. The decrease of £1,196,000 from Period 7 of receipts from inland waterways, freight haulage, and ships continues the falling trend. There is a decrease of £700,000 on the corresponding period for last year, and the aggregate decrease is now £1,413,000. This item is now having a marked effect on total receipts, which in this period are £454,000 less than in the corresponding period of 1953. The aggregate totals are also affected, and have now decreased to £9,758,000 over those for the corresponding weeks of last year, compared with £10,230,000 at the end of Period 7.

PERCENTAGE VARIATION 1954, COMPARED WITH 1953

	Four weeks to August 15	32 weeks to August 15
British Railways—		
Passengers ...	— 2.9	+ 1.2
Parcels ...	+ 6.5	+ 4.7
Merchandise & Livestock ...	— 1.6	+ 3.0
Minerals ...	— 4.4	+ 1.1
Coal & Coke ...	+ 6.4	+ 6.0
Total ...	— 0.2	+ 3.2
C. & D. services ...	+ 3.5	+ 4.7
Ships (passengers) ...	+ 6.3	+ 5.8
British Road Services, Inland Waterways and Ships (cargo) ...	— 12.2	— 2.7
Road Passenger Transport, Provincial & Scottish... ..	+ 1.8	+ 3.1
London Transport—		
Railways ...	+ 4.5	+ 3.2
Road Services ...	+ 1.9	+ 3.3
Total ...	+ 2.5	+ 3.3
Aggregate ...	— 0.8	+ 2.5

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Passenger Timetables and Rolling Stock

August 30

SIR,—In your issue of August 27 Mr. H. G. Stephens states that he has never been given a good reason as to why electric trains to Hastings and Eastbourne cannot be divided at Polegate.

The answer to this question lies in the fact that the platforms at Polegate are not long enough to accommodate 12-coach electric trains without them fouling the junctions at both ends of the station when it involves splitting or joining coaches.

It would, therefore, be necessary to move the junctions and re-align the approaches to the station so that the platforms could be lengthened, involving engineering works which would be extremely expensive.

Yours faithfully,

F. D. Y. FAULKNER,
Public Relations Officer,
Southern Region, British Railways

Waterloo Station, S.E.1

August 30

SIR,—Many will agree with the letters you have published on this subject, but it is not only in respect of the timetable that the Brighton-Hastings is the Cinderella of electric services from Brighton. The contrast between the old straight-back suburban type stock of Eastbourne and Hastings trains and that of (a) the Worthing and Portsmouth and (b) the London services is so marked as to be

open to scathing remarks by passengers. Surely these county boroughs, not to mention the county town on this route warrant an hourly semi-fast service of corridor stock—full corridor or of the Portsmouth two-unit type—calling only at Lewes, Polegate, Bexhill, and St. Leonards Warrior Square? Eastbourne portions could be detached and attached at Polegate, giving a Brighton-Eastbourne service with only two intermediate stops, and Brighton-Hastings with four, instead of the seven and 17, respectively, of the present services.

Yours faithfully,
BRIGHTON & SOUTH COAST

BRITISH INSULATED CALLENDER'S CABLES AT THE BAGHDAD TRADE FAIR.—British Insulated Callender's Cables Limited will exhibit on its stand at the Baghdad Trade Fair a comprehensive range of electrical equipment. For high-voltage transmission and supply there will be shown equipment for overhead transmission lines, with high voltage cables and accessories; for distribution purposes there will be exhibited medium and low-voltage cables, wiring systems for industrial and domestic installations, copper bus-bars, and power capacitors. Other items will include cables and wires for telecommunication systems, current collection equipment for cranes and conveyors, trolleybus overhead equipment, and railway electrification equipment. The stand will also feature Callender-Hamilton bridges, six of which, valued at £69,000, were ordered recently by the Iraq Development Board.

PUBLICATIONS RECEIVED

Clerical Salaries Analysis 1954. London: Office Management Association Limited, 8, Hill Street, W.1 9½ in. × 6 in. 86 pp. Price 25s.—This is the sixth survey to be undertaken by the Association, the first having appeared in 1942. The basis of the statistics presented has been broadened by the inclusion of details of the salaries of over 70,000 clerical workers in the preliminary returns. The tables give salaries by areas, trades, and grades established by the type of work performed. Salaries for each grade are shown as a median rate, with the upper and lower quartiles and the percentage of dispersion. The trends revealed by the statistics are commented upon by Mr. O. G. Pickard. There is a series of additional tables giving details of salaries in large organisations not otherwise represented in the book, including British Railways.

Directory of Railway Officials & Year Book, 1954-55. London: Tothill Press Limited, 33, Tothill Street, Westminster, S.W.1. 8½ in. × 5½ in. 530 pp. Price 40s.—Although the layout of the 1954-55 volume of this directory, now in its sixtieth year of publication, remains the same as that of its predecessors and it contains the same number of pages as the 1953-54 edition, much revised information is incorporated.

The disappearance of the entry relating to the Railway Executive is one of the first and principal changes to be noted. The Executive was absorbed by the British Transport Commission on October 1, 1953, when the Road Haulage Docks & Inland Waterways, and Hotels Executives were abolished also. The changed form of administration of the Commission's road haulage business, docks and inland waterways, and hotels and catering services is explained and amended entries appear for these interests. The officers of the former Railway Executive are shown with their new designations in the Commission itself or the Regions. Reliable information on the railways of China, Russia and most of the countries of Eastern Europe has again not been forthcoming, but the directory contains particulars of the system of the Republic of Korea, the first authentic information to be obtained from Korea since 1937. Of new entries in the overseas sections the most important is perhaps that for the new Quebec North Shore & Labrador Railway in Canada. Two important urban passenger transport undertakings, those of Toronto and Stockholm, find a place for the first time by virtue of the new underground railway systems which they now operate.

Much of the statistical and other detail relating to British Railways has been amended by the British Transport Commission. In particular the information on the classification of merchandise on British Railways has been brought up to date. Maps show the

extent of the British Railways Regions and British Road Services Divisions, and the Divisional Waterways Organisation.

We See Ourselves.—By J. W. Stafford, London: Frank Moxley, 80, Eamont Court, St. John's Wood, N.W.8. 8½ in. × 5½ in. 23 pp. Price 6d.—This booklet by the President of the National Union of Railwaymen, with a foreword by Mr. F. G. Moxley, Editor of the *Railway Review*, gives an overall picture of the permanent way staff employed by British Railways, and makes some comparisons with conditions in other countries. The text is enlivened by anecdotes and verse and forms an interesting account of the work of the permanent way man from his own viewpoint.

Hochbauten der Eisenbahn (Railway Buildings). By R. Spröggel, Berlin, Göttingen, and Heidelberg: Springer Verlag. 214 pp. 9½ in. × 6½ in. 266 figs., a number of them photographs. Price DM. 31.50.—This volume is part of a new edition of a series of engineering handbooks, originally prepared before the 1914 war and published mostly after it. The first edition, by C. Cornelius, appeared in 1920. The many changes in form and style of building used for railway purposes and the amount of new structures called for since the recent war necessitated a new issue. The work covers every kind of station building, signalbox, goods shed and depot, locomotive shed, stores, water tower, repair shops, engineer's departmental buildings, staff resting buildings, and dormitories, convalescent homes, and so on, from the point of view of the detailed requirements in the various cases, amount of traffic, relation of the station to the town and its surroundings, or needs arising from special traffic such as race or exhibition. The illustrations show the care that has been devoted to rebuilding destroyed or damaged stations in Germany and the variety of design used.

Trends and Cycles in Capital Formation by United States Railroads 1870-1950. By Melville J. Ulmer. New York: National Bureau of Economic Research. 70 pp. Price \$1.50.—Professor Ulmer of the American University has produced a paper, well provided with figures, tables, and diagrams, which will be of interest to every serious student of railways. Dr. Ulmer's figures cover all types of fixed, reproducible, railroad capital, including track, terminals, locomotives, passenger and freight vehicles, and other equipment. Only land and land rights are excluded. Among the conclusions is the statement that U.S. railroads produce today six times as much output with the same amount of capital as they did in 1882. Railroad capital utilisation per unit of output is still much higher than

that of manufacturing industries. Capital expansion occurred in cycles which kept pace with the changing currents of business over the period studied, and the estimates in this paper show a striking decline in the capital-output ratio as the history is unfolded.

Lloyds Craftsmen in Steel.—This booklet of F. H. Lloyd & Co. Ltd., Weynesbury, South Staffs, tells something of the part played by craftsmanship in the manufacture of steel castings, and of the way in which developments in technique and applications of machine power have assisted that craftsmanship. There are many illustrations of processes and of a wide range of typical castings for railway and other uses.

Tangye Products.—A large range of equipment for railway engineering workshops is made at the Cornwall Works, Smethwick, near Birmingham, of Tangyes, Limited. This includes wheel and axle lathes, hydraulic jacks and presses, testing machines, pumps, heating stoves, stationary diesel engines, and hydraulic sleeving presses for pressing in oil engine cylinder liners. All these are dealt with in the company's publication No. 756, *Tangye Products for Railway Shops*.

Paxman Railway Engines.—A new edition of the Paxman traction catalogue details 17 different models of railway four-stroke oil engines, in four different series, extending from 75 to 2,000 b.h.p. The RPH and YH series have 7 in. by 7½ in. cylinders with certain common parts, and together cover the range from 165 to 1,000 b.h.p. in medium-weight and light-weight engines of 1,250 r.p.m. The larger YL range, covering all the four-figure outputs, has 9½ in. by 10½ in. cylinders.

Traction Literature.—Two new illustrated publications from the English Electric Co. Ltd. deal respectively with the Santos-Jundiá electrification in Brazil, and with the 1,760-h.p. A1A-A1A diesel-electric locomotives of the South Australian Railways. The booklet, "Main Line Electrification in Brazil," describes in 22 pages the whole of the motive power, substation, and overhead line equipment for which the English Electric Export & Trading Co. Ltd. was responsible. Features of the locomotives are illustrated, and a folding diagram shows their power circuits and principal dimensions. There is a somewhat shorter description of the multiple-unit trains, with dimensional drawing and seating layout. In the publication "Main Line Diesel-Electric Locomotives for South Australia," the principal features of these units are concisely dealt with and adequately illustrated, while a folding chart shows the main dimensions and internal arrangement in detail, with cross sections at various parts of the body.

THE SCRAP HEAP

Understatement

Since a pointsman was taken by a lion at Malampaka, there was a general apathy on the part of pointsmen to walk out to the signals with the signal lamps.—*A traffic inspector's report, quoted by "East African Railways & Harbours Magazine."*

The First Railway in Norway

The following is an extract from *The Illustrated London News* of September 13, 1851, describing the cutting of the first sod of the railway from Christiania (now Oslo) to Eidsvoll:—

"The concession has been granted by the Government of Norway to a company of capitalists, consisting of Mr. Peto, M.P.; Mr. Ricardo, M.P.; and Mr. Brassey. One half of the capital is to be furnished by the Norwegian Government; and it guarantees the other half at 5 per cent. Mr. Robert Stephenson and Mr. Bidder are the engineers; and the contractors . . . are Mr. George Merritt and Mr. Earle.

"At twelve o'clock on the 8th ult. the Government and municipal authorities of Christiania, together with a large proportion of the members of the Storting, marched in procession from the Bishop's palace to the spot outside the city where the ceremony was to be performed. . . . Mr. Peto, Mr. Stephenson, and Mr. Bidder having received his Excellency the Stadtholder Lovenskold, the barrow and silver spade required for the operation were presented to that distinguished functionary. The first sod having been cleverly dug and wheeled off amid the cheers of the assembled multitude, the firing of a Royal salute, and the performance of the national airs by the military bands, his Excellency made an eloquent speech, in which he . . . congratulated his

auditors that it (the railway) was to be made by English contractors, and that the money was to be provided by English capitalists. This sentiment was received with enthusiastic bursts of applause. A patriotic song appropriate to the occasion, and composed expressly for it, was then sung by the united singing clubs of the town . . .

"In the evening a sumptuous dinner was given by the magistrates and corporation of the city to about 250 persons, amongst whom, in addition to the Stadtholder, Messrs. Peto, Stephenson, and Bidder, were Mr. J. R. Crowe, the British Consul-General (to whose perseverance and negotiations the Norwegians are indebted for the construction of this railway). [After the loyal toasts] the 'Health of Mr. Robert Stephenson' was drunk, and most enthusiastically responded to."

Railway Flavours

There is a Great Eastern flavour about East Anglia, a London & North Western atmosphere in a great broad band from Euston to Holyhead, Kent is South Eastern & Chatham, Hampshire is London & South Western. And even today there is a South Western feeling about North Devon and North Cornwall, where those single lines wind boldly into Great Western territory. Rivalry between railway lines need not disappear with nationalisation. Indeed, local pride and regional loyalties are part of what we most enjoy about living in England. Perhaps when railways become conscious of themselves again as individuals, Midland for comfort, London, Tilbury & Southend for frequent trains, Cheshire Lines for good aerial views from viaducts and embankments, Great Northern for speed, Great Central for luxury, Midland & Great

Northern for beautiful and flowery stations, and so on—perhaps when these happy days return the different lines will put new life into their forgotten branches.—*John Betjeman, in "The Spectator."*

Self-Service

Three Stockholm suburban stations, where porters are scarce, are trying out light, two-wheeled, help-yourself luggage barrows labelled "Swedish Railways at Your Service."—*From "The Daily Telegraph."*

Trainspotting from the Castle

(*On the roof of the Castle Keep, Newcastle-upon-Tyne.*)

The railway lines, directly beneath, have a mesmerising effect: no wonder that this roof has become the most famous place in the North for train-spotting. "Every Saturday and Sunday they come," says the attendant. "Some come to spot trains and some just to play around."

A perilous playground, it seems. Surely this does not tie up with the news that a single Newcastle shop, in deference to public fears, recently cancelled an order for 2,500 bow and arrow sets? But it is a weekday; the battlements are occupied by a party of adult Americans, shooting each other with nothing more dangerous than cameras. Their excitement floats out across the Tyne like the cry of gulls. The fame of the Plantagenet trainspotters seems to have spread far. Seeing me jot something down in a notebook, one of the Americans calls out: "Just look there, Myrtle. They do it at all ages, I guess."—*From "The Manchester Guardian."*

Lover, Come Back to Me!

(*Local authorities are reported to be petitioning for the re-opening of the Coalport-Wellington branch line, closed in 1952.*)

I am a branch-line lover, unashamed; Homely, familiar, often quaintly named, They speak to me of England unassailed, Where the forefathers of my hamlet toiled.

They served them well, oblivious of the need
For all today's uncompromising speed,
Weaving their way into the nation's heart,
Content to play their unassuming part.

Now someone wants a branch-line back again;
Small wonder that my heart sings a refrain,
Pausing alone to get the breath to say
A frequent, uninhibited "Hooray!"

Troubled at times by the ephemeral,
Dazed by the pace of things in general,
I doff my cap when life turns back a page

And ridicules this record-ridden age.

A. B.



Cutting the first sod, at Oslo, of the first railway in Norway (see also article on page 267)

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Doubling in Orange Free State

The new station at Virginia, Orange Free State, was opened on June 16. The station, which with the adjoining yards cost some £100,000, is part of the £4,000,000 scheme for doubling the important section between Bosrand and Van Tonder on the line from Kroonstad to Bloemfontein.

The new double-track deviates eastwards from the old line and has easier gradients and curves. A section of the old line is being used as part of a new line to serve the fast-developing mining areas of Welkom, Odendaalsrus and Allanridge to the west.

In straightening and improving the section between Cronnell and Kalkvlakte it became necessary to build a new high level bridge across the Sand River near Virginia at a cost of £100,000. It is expected that about 93 of the 128 miles between Bloemfontein and Kroonstad will be completed by the end of the year.

Traffic Increase

By the end of last February, the eleventh month of the 1953-54 financial year, the railways had moved 65,242,586 tons of goods traffic, an increase over the corresponding period of the previous financial year of 1,961,586 tons. The grand total for the year should easily exceed 70,000,000 tons, a new railway record.

Passenger journeys recorded during the eleven-month period of the 1953-54

financial year numbered 251,699,590. This represents an increase over the corresponding period of the previous year of 6,304,345. First and second class passenger traffic showed no important fluctuations but third class journeys advanced from 132,701,327 to 138,586,949, that is, by 5,885,622. First and second class suburban traffic remained nearly constant, although there was an increase of approximately 500,000 in second class suburban traffic. Third class suburban traffic once more reflected a large increase—from 116,735,795 to 122,325,169 during the first eleven months of 1953-54, an advance of 5,589,374.

INDIA

Ahmedabad-Kalol Doubling

The 17-mile Ahmedabad-Kalol section of the Western Railway metre-gauge main line from Ahmedabad to Delhi carries a heavy traffic. The rapid growth of suburbs around Ahmedabad, the number of metre-gauge branch lines between Ahmedabad and Mehsana, and the delays to goods traffic caused by the considerable passenger traffic have increased the need to double this section. The doubling is to be carried out at an estimated cost of Rs.96 lakhs; the section from Kalol to Mehsana will be undertaken later. This will be the first section of double line on the metre-gauge line between Ahmedabad and Delhi with the exception of about two miles between Delhi Serai Rohilla and

Delhi Junction which was handed over to the former North Western Railway in 1927 and is now part of the Northern Railway.

At the same time it has been decided to remodel Sabarmati Yard, about four miles from Ahmedabad. This yard is of great importance for the transshipment of goods between the broad gauge and the metre gauge. The present yard has reached its capacity and the demand for speedier transshipment of goods and increased handling of goods traffic cannot be met. The work is estimated to cost Rs. 1½ crores.

Standard Refreshment Room Menus

The Railway Board decided to introduce, with effect from September 1, a standard menu and a standard charge for Indian-style meals in railway refreshment rooms throughout the country. The classification of meals as first, second, and third, wherever it existed, has been abolished.

On the Southern Railway, a standard menu has been prescribed for a vegetarian meal only because the demand for non-vegetarian meals in South India is said to be negligible.

CANADA

Railway to Great Slave Lake

The Government is considering the construction of a 300-mile line from Grimshaw, in Northern Alberta, to the Great Slave Lake. It may run parallel to the Mackenzie highway but detailed surveys are necessary before the route can be settled.

Grimshaw is on the Hines Creek line of the Northern Alberta Railways, a system owned jointly by the C.N.R. and C.P.R., and is some 333 miles north-west of Edmonton.

UNITED STATES

New York Central "Siesta" Coaches

As a result of the highly favourable public reaction to the recent exhibition in New York of a "mock-up" of the new Budd "Siesta" coach design, providing full sleeping accommodation for coach or third class passengers, the New York Central System has announced its intention to purchase ten cars of this type.

The First U.S. Talgo Train

The Chicago, Rock Island & Pacific Railroad has ordered from A.C.F. Industries, Inc., a complete train of Talgo-type stock. It will differ from the Talgo trains already in use in Spain, in that the Talgo units will be formed in triplets into articulated coaches, each with closed end vestibules, and each coach attached with tightlock couplers to its neighbours. The weight of the train, which will consist of four of these



Photo]

[A. R. Lyell

A 4-8-4 × 4-8-4 Beyer-Garratt locomotive at the head of a 31-wagon train totalling 650 tons on the 1 in 40 between Hawkesbury River and Cowan, New South Wales Railways. A 2-8-0 locomotive assists at the rear

coaches, or twelve units, will be about half that of conventional stock seating the same number of passengers (300). It will be possible to haul these coaches in either direction, instead of in one direction only, as the Spanish train.

Tentatively named the "Jet Rocket," in line with the "Rocket" series of diesel-hauled streamline trains operated by the Rock Island, the new train is intended to replace the existing "Peoria Rocket," which makes two double journeys daily over the 161½ miles between Chicago and Peoria in 2 hr. 35 to 45 min., with two to four regular and two conditional stops in each direction. First class fare will be charged in each direction, but after the fashion of modern air travel, this will include a meal served at the passenger seat. The estimated cost of the new train is \$600,000. The floor height of the new stock will be about 25 in. above rail, compared with the 18½ in. of the Spanish Talgo train and the 51 in. of conventional American stock.

Relative Passenger Service Costs

Calculations which have been made by the Interstate Commerce Commission show that charges for the different varieties of passenger accommodation in trains are not proportionate to the nature and cost of the service rendered. Compared with the service rendered in reclining chair cars—the equivalent of third class—on the average it costs 2.3 times as much to provide, a berth in a tourist sleeping car, 2.76 times as much in a standard sleeper, and 3.29 times as much in a lightweight sleeper. That is to say, the differential in cost for sleeping car accommodation is disproportionately low.

ARGENTINA

Accidents

Four accidents have occurred recently on the Argentine railways, one of major and three of secondary importance.

The "Estrella del Norte" express of the General Mitre Railway, running between Tucuman and Buenos Aires, left the rails between Benavidez and General Pacheco stations in the Buenos Aires outer local section, some 25 miles from Presidente Perón. The locomotive plunged down an embankment and became partially submerged in a ditch running parallel to the line. All the coaches, including five sleeping cars and a dining car, were derailed, destroying and blocking both tracks over a distance of some 300 yd. The casualty list totalled nine seriously and 24 lightly injured.

A further accident occurred on the same railway when "El Santafesino," the Santa Fe to Buenos Aires express, left the rails between Otamendi and Rio Luján. All the coaches but one left the rails, but did not overturn. The locomotive broke away and ran ahead for some 200 yd.; this probably avoided a more serious outcome. Six of the restaurant car staff received slight injuries.

On the Sarmiento Railway, the last coach of a suburban electric train running between Moreno and Plaza Miserere (formerly Plaza Once) derailed completely when passing from the slow to the fast up line at Haedo. It overturned and 28 passengers were injured, some seriously.

A goods train of the General Roca Railway became divided between Carhué and Erize stations. The latter part ran back and collided with another goods train. One of the drivers was injured.

ITALY

New Works

Works for which funds are to be made available during the financial year 1954-55, include the completion of the lines from Savona via Altare to San Giuseppe, from Portogruaro to Udine, from Lucca to Aulla, from Villamasargia to Carbonia, from Cagliari to Decimomannu, and from Caltagirone to Gela. The ring railway round Rome is to be completed. In addition, new works are to be begun at the harbours of Piombino, Civitavecchia and Palermo. Authority is being sought for major works, to be extended over eight years from 1955, at Savona, where the station is to be moved and the Varazze-Savona line diverted.

Other works contemplated include construction of lines in Apulia and Calabria and abolition of level crossings.

SWITZERLAND

Doubling Main Lines

Work on the doubling of important main lines hitherto single track is proceeding in five different parts of the country. Two of these sections are on the Olten-Solothurn-Biel-Neuchâtel-Yverdon-Lausanne line. On July 5 the doubling from Bevaix to Gorgier-St.-Aubin, between Neuchâtel and Yverdon, was brought into service; this stretch of nearly three miles completes the postwar doubling of over eight miles westwards from Auvier, and from Neuchâtel towards Yverdon 10½ miles (roughly half the distance) now is double line.

The second section is that extending eastwards from Solothurn to Oensingen, in the direction of Olten. This is making good progress; the second track is in use over the 3½ miles from Solothurn to Luterbach and Deitingen, both of which stations have been rebuilt. The laying of the additional track towards Wangen is well forward. Near Wangen a bridge of considerable size across the River Aar is being built, and there are to be new stations also at Wangen and Niederbipp.

The other main line of which the remaining single line sections are being doubled is from Zurich to Sargans, carrying the traffic for both Chur and the Arlberg line. Work on this also is proceeding at two different points—on

the Pfäffikon-Ziegelbrücke section between Lachen and Sieben-Wangen bordering the Lake of Zurich, and farther east between Murg and Unterterzen bordering on the Wallensee. Both these doublings are likely to be brought into use this year; the second adds further to the work already completed between Unterterzen and Sargans.

On the main line from Berne to Lausanne the only remaining single line section is now the 1½ miles from Chénens to Cottens, where doubling is in progress.

FRANCE

Central Control of Train Crews

In recent years the Western Region of the S.N.C.F. has been introducing centralised control of train crews. Previously train crews were entirely under the control of their home station, but, in each *arrondissement* of the Region, a central office has been set up to exercise general supervision of the working of train crews. The crews for regular turns are still allocated individually by the local depots, but all extra and replacement turns are allocated by the central office. Considerable economy of staff has resulted, it being estimated that some 400 train personnel have thus been released for other duties in the Region during the past four years.

Motorised Shovel for Unloading

A form of motorised shovel for the unloading from railway wagons of bulk-loaded goods has been put into service. An easily manoeuvrable tractor propels a shovel with a capacity of 10.6 to 14.1 cu. ft. This vehicle enters on one side of the wagon and propels the contents through the other door. The centre of the wagon is first cleared to create a working space, after which the shovel is used gradually to widen this space by working the two ends alternatively. With the use of this equipment a 20-tonne wagon of coal can be emptied in from 40 to 50 minutes.

NETHERLANDS

New Stations

New stations at Arnhem and Nijmegen have been brought into service. At Arnhem, after the demolition of the ruins of the old building and on the same site, a new building has been constructed entirely in reinforced concrete. On the far side of three new platforms, a second building has been erected, connected to the platforms by an overbridge.

At Nijmegen the reconstruction has been on a smaller scale than at Arnhem, as the general layout of the old station has been restored. On the old foundations and on what remained of the old building, the façade has been erected with a width of 180 m. and a tower in the centre. Behind this façade the interior has been renewed. Red brick and an imitation of French cut stone of light tint have been used.

A Paradox of Modern Railway Management—3*

Financial basis for provision of new equipment: effect of organisational changes

*By A. R. G. Saunders, B.Com.,
Acting General Manager, Sierra Leone Railway*

WHILST the immediate cause of the pyramids of groundnuts at Kano, in Nigeria, and of the piles of produce in Sierra Leone awaiting transport to the port for export, is of course, a shortage of locomotives and rolling stock, the shortage is the longer-term result of a failure to maintain an equilibrium between the supply of and the demand for transport. New locomotives and rolling stock involve great capital expenditure; and on the face of it, it would seem that a very large expansion of traffic would be necessary to justify such expenditure. One of the more surprising things about railway business is that, despite appearances, this is not so; very little additional traffic is in fact required to justify considerable capital expansion. It is possible to demonstrate this only by considering a particular case.

A new wagon on the 2-ft. 6-in. gauge Sierra Leone Railway costs some £2,000 and will carry 12 tons of bulk goods. The average length of haul on the railway is 157 miles (1952 figure). Assuming a flat rate of 3d. a ton-mile, then, with an operating cost of $\frac{1}{4}$ d. a ton-mile, which gives a surplus of $2\frac{1}{4}$ d. a ton-mile, the surplus revenue on a wagon load of 12 tons for a distance of 157 miles is £19 12s. 6d., say £20. If interest charges are taken at $3\frac{1}{2}$ per cent and the life of the vehicle is 25 years, then the cost of a new wagon is about £125 (£70 interest and £55 depreciation) a year.

In other words, about 60 tons of additional traffic a year will pay the costs of a new wagon. If the traffic is carried at 6d. a ton-mile, then only 30 tons of additional traffic are necessary to justify one additional wagon.

With a locomotive, the figures are about 10 times as large, but these are still comparatively small figures in relation to the tonnages that are handled on a railway. All additional traffic above such figures, will contribute fully to the other fixed costs. In the case of new passenger coaches the full operating costs and interest and depreciation costs are borne if a train is 11 per cent full.

Ultimate Cost of Efficiency

On November 1, 1953, the beginning of the new season, 180,000 tons of groundnuts from the previous season were still awaiting railway transport in the north of Nigeria. At a price of £35 a ton, and with interest charges at $3\frac{1}{2}$ per cent per annum, the cost of this delay was £220,000. This is the real cost of the shortage of wagons and locomotives, the ultimate cost of railway efficiency.

This cost is now borne by the Nigerian Groundnut Marketing Board, a quasi-Government trading concern, and provides some measure of the extent to which development has been retarded, in the case of but one single commodity. The business of the railway is now subordinated to the carriage of groundnuts. This sum of money is sufficient to pay for some half-dozen new locomotives outright.

Forms of Organisation

Once it is established that the prosperity of a railway depends on the elasticity of demand for transport, it is possible to reach a solution of a very old railway controversy. There are two ways in which a railway can be organised—departmental, and divisional. The essential practical difference between them is that with a departmental organisation, the responsibility for the maintenance and operation of the locomotives lies with the mechanical department under the chief mechanical engineer. If the traffic department requires power to haul trains, it has to requisition it from the mechanical.

With a divisional organisation responsibility for the locomotives is divided. The operation of the locomotives and arrangements for running shed maintenance are the responsibility of the traffic department, and to this extent the responsibility for locomotives is hived off from the mechanical department. The latter department continues to be responsible for shop maintenance, i.e., the long-term periodical overhaul.

Such a division of authority and responsibility is not a satisfactory arrangement. The mechanical department cannot programme its overhauls and in the result it cannot keep its costs within its own control. The costs of overhaul are higher because the traffic department tends, especially in busy seasons of peak traffics, to overwork the locomotives. This causes the repair bill to mount and the cost per mile run to rise. These higher costs are quite easily met from the increased revenue, and in fact when considered as a cost per ton-mile the increase in costs is minute. The position is, from the point of view of the mechanical department alone, very unsatisfactory, and however one considers it, the division of responsibility leads to inefficiency.

But there is one consideration, the most important of all, which outweighs all this inefficiency. As the prosperity of a railway is dependent on demand and as the problem of a railway is to earn sufficient revenue to meet the fixed costs, then the greater the flexibility of the organisation in responding to demand, the better.

With a divisional organisation, the traffic department does not have to requisition power from another department, for it disposes of the power itself. It is for this reason far more flexible and suited to commercial needs.

The subordinate officers of the mechanical department under a departmental organisation actually involved in supplying power on the requisition of the traffic department, inevitably consider the condition of the locomotives, their own repair programme, and their own costs, before they consider importunate requests for more power.

If society were in a state of economic equilibrium, then there is no doubt that a departmental organisation would be superior. Locomotives could be worked rhythmically, efficiently, and economically according to a fixed, unchanging plan—the ideal objective of the technician with his instinctive pre-occupation with efficiency.

State Ownership

When a railway is State-owned and when, more particularly, it has to budget its expenditure, the position of the chief mechanical engineer under a divisional organisation is almost untenable. He is responsible for estimating the expenditure of his department and for seeing that the budgeted amount is not exceeded. If he has no control over the employment of the locomotives, then clearly he has no control over the expenditure for which he is responsible. The emphatic preference of a chief mechanical engineer for a departmental organisation is perfectly understandable.

On the Sierra Leone Railway, it would have been impossible to secure the expansion of revenue that did occur in 1950, had the railway been organised on a departmental basis.

The history of some of the larger railways in the colonial territories of the British Commonwealth is one of change from one organisation to another. The Nigerian Railway has changed four times in the last 30 years. It had a departmental organisation until 1951; it now has a divisional organisation. The Malayan Railway was reorganised on a departmental basis in 1951. The controversial nature of this problem is exemplified by the special stresses set up by Government ownership. In societies characterised by fluctuating demand, and in overseas territories especially by rapid growth, a divisional organisation is essential to that growth, for a departmental organisation is inherently less responsive to change. It leads to ossification rather than expansion.

(Concluded)

* Parts 1 and 2 appeared in our issues of August 20 and 27, 1954

Silicones for Traction Motor Insulation

Materials with higher heat-resisting properties permit increased power output

ELECTRIC traction motor ratings are based on the output obtainable at the motor shaft for one hour or continuously without the temperature rise in the armature, field windings or commutator exceeding specified figures. The ability of the insulation to withstand high temperatures combined with mechanical stresses is a limiting factor, and motors for traction service are usually rated in accordance with the capacity in this respect of the group of insulating materials known as class "B." These consist of mica, glass fibre, or asbestos bonded with organic resins and are suitable for temperatures up to about 130° C. By increasing this limit it becomes possible to up-rate the power output from a motor of given physical characteristics.

A new range of insulating materials based on silicones (organic compounds of silicon) was introduced in the U.S.A. by the Dow Corning Corporation in 1943. When mica, glass fibre or asbestos are bonded with silicone resins or silicone rubber, the insulation may be used at temperatures up to 200° C. Since the development of these silicones the American Institution of Electrical Engineers has introduced a new classification, class "H," permitting silicone-bonded materials to operate up to 180° C.

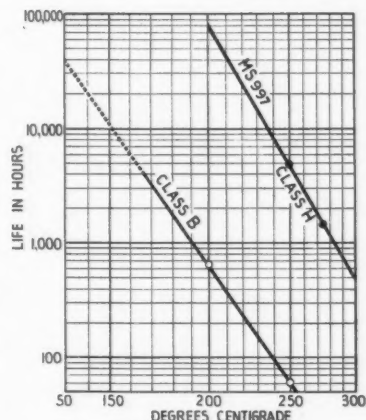
The accompanying graph compares the thermal endurance of 0.004 in. glass cloth coated with silicone varnish, with that of ordinary class "B" material.

The strips on which the tests were made were dip-coated with the varnish, cured, and then dipped and cured again to give a finished thickness of 0.007 plus or minus 0.001 in.

Application to Traction Motors

International recognition of class "H" materials is under consideration. Silicones are now being produced in Great Britain by Albright & Wilson Limited, and marketed by Midland Silicones Limited. Practical experience of their use in railway traction motors has been gained already from the performance of a number of silicone-insulated motors operating on the London Transport system.

The armature coils of the London Transport motors referred to above are formed of copper strips insulated from each other by silicone-bonded mica glass tape applied to each strip. The assembly is impregnated with silicone varnish and pressed to shape along the slot sections. Insulation of the completed coil to earth is provided by glass tape coated with Silastomer (silicone rubber), an entirely new insulating material which remains elastic and maintains its electric strength throughout the temperature range from -60° to 200° C. Its property of retaining resilience unaffected by prolonged exposure to high temperature is particularly advantageous for coils subject to the intense stresses set up by vibration, expansion and contraction of

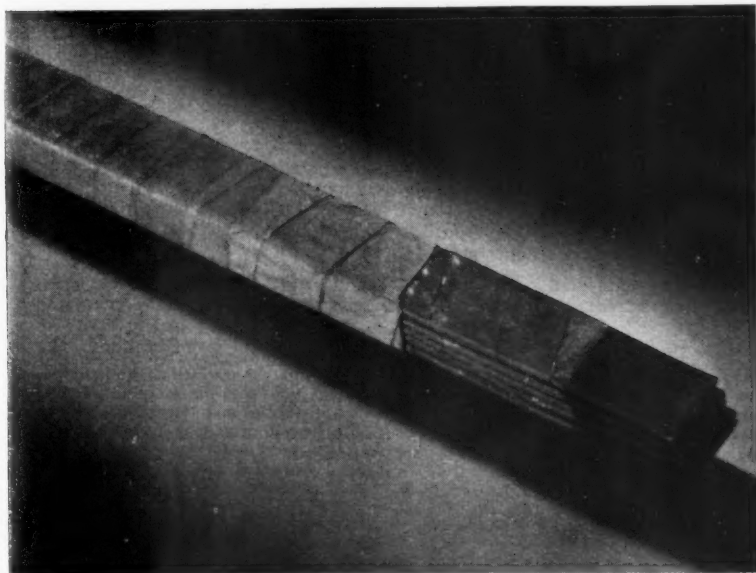


Comparison of thermal endurance of silicone varnishes

iron and copper, and centrifugal force, such as are encountered in high-performance traction motors. The tape is applied semi-vulcanised, and when heated for a few minutes at about 150° C. vulcanisation is completed to form a tough, rubbery insulation, highly resistant to moisture in addition to its other characteristics.

In the U.S.A. silicone materials have proved their reliability in traction service to an extent that has led the Santa Fe Railroad to undertake a programme of modernising all motors for its heavy-duty diesel-electric locomotives by using silicones for the insulation of field, interpole, and armature coils. The field and interpole coils now have a wrapping of Silastic tape (similar to Silastomer) in addition to the initial layer of fibrous glass tape pretreated in silicone varnish and the second covering of silicone-bonded mica glass tape. The armature coils are insulated with silicone-varnished glass cloth. Before treatment these motors were rated continuously at 700 amp., but with their new insulation the rating is a little over 825 amp.

A characteristic of Silastomer and Silastic tape which helps to permit higher loadings of this order is its high thermal conductivity. Coils filled with silicone rubber paste and wrapped with an outer jacket of silicone rubber tape have been built to operate under the same load at a temperature as much as 50 per cent below the temperature of identical coils vacuum-impregnated with resinous insulating varnishes. Experiments with test coils have shown that ratings can be increased by some 20-30 per cent when one of these tapes is used, compared with the figure for ordinary mica glass tape insulation,



End of armature coil, showing method of taping and varnishing for silicone bonded insulation

because at any given operating temperature more watts can be dissipated through the silicone rubber jacket.

In all branches of electric traction the tendency today is towards extracting greater power output from machines of a given size and weight. Continuous current ratings, and with them the problems of heating, are on the increase. As

a somewhat extreme case at the moment, although one of much significance for the future, it may be quoted that the continuous current per motor in one single-phase, 50-cycle locomotive is rated as high as 3,000 A. Heavy demands are made, also, on locomotives for the standard d.c. systems, and the requirements of operating departments

may involve their use at times on routes and duties more severe than those considered at the design stage. In such circumstances the margin of safety inherent in new insulating materials of the types described makes an invaluable contribution to the usefulness of the electric locomotive as a traffic-handling machine.

Modernisation of the Aigle-Champéry Railway

Retention and improvement of a Swiss local line formerly threatened with abolition

AFTER much debate between cantonal and other authorities it was resolved not to replace the metre-gauge electric railway running between Aigle, in the canton of Vaud, on the main Simplon route, and Champéry, in the canton of Valais, in Switzerland, by road motor services, as had been proposed, but to modernise the railway equipment to facilitate better service.

Road traffic in the district is liable to interruption in winter, the railway can be kept in operation with much greater regularity in bad weather. There is a good seasonal traffic to the winter sports areas, and to have substituted road services would have involved appreciable capital expenditure if anything equalling the carrying capacity of the railway was to be provided. Most of the traffic is passenger, about 360,000 persons having been conveyed annually in the last few years. Freight is limited to stone from quarries, timber, cattle, and some parcels and postal traffic. Through complete loads by transporter wagon are run to the Federal Railways. The line is nearly 15 miles long, with three Strub-type rack-rail sections totalling 3,936 yd.

In 1905 a company was formed to build the seven miles from Aigle through Ollon and Colombey to Monthey, opened on April 2, 1907. The line in Monthey much interfered with the traffic in the market place and was re-routed in 1920. Another company was set up to construct the line to Champéry northwards to Monthey and this was opened on January 30, 1908.

Direct current at 750 V. supplied by overhead wire was used for both lines. The two concerns were operated separately until January, 1946, when the Aigle-Ollon-Monthey-Champéry Company was formed.

Plans for Modernisation

Schemes for modernising the electrical equipment of both lines were considered at various times. The shareholders in 1948 adopted a proposal to replace the Aigle-Monthey section by road services, combined with a direct road tourist car service from Aigle to Champéry. As engineering and financial difficulties stood in the way of widening some road sections other proposals were discussed, including complete abolition. In 1949, the company applied for aid in modernising its system and finally the Federal authorities confirmed that this would be the best course, retaining the original route of the line.

The bridges and other civil engineering works were found to be in good condition but the track and overhead line needed bringing up to date, and the rolling stock, most of it almost 50 years old, was obsolete.

New Rolling Stock

Four new motor coaches were obtained. All wheels are motored giving a maximum speed with adhesion only of 31 m.p.h. and 15 m.p.h. when ascending the rack sections. The coaches carry 30 passengers seated and 51

standing and can haul 56 tonnes on the up journey or 70 on the down. Controls are direct-acting, with four running positions with shunt effect for use on the rack sections when the vehicle is running alone.

The speed of 15 m.p.h. is said to be the maximum attained as yet with the Strub type of rack rail. Rheostatic braking is used from 31 m.p.h. down to about 3 m.p.h. and can be closely regulated; when descending the rack sections the speed can be kept constant. Besides the rheostatic brake there are an automatic air brake used ordinarily to make the final stop, with a spring power brake coming into action automatically on failure of the air; a powerful hand-operated band brake; and an electro-magnetic track brake fed from the battery. These precautions are general on all lines of this kind in Switzerland.

Until 1931 the line had been fed from rotary converters but in that year rectifiers were substituted and the converters kept in reserve. There are now three substations in place of two, to improve the voltage regulation on the steep grade sections, and the old converters have been disposed of. Where the line follows the road the track is to be renewed, but, elsewhere re-sleeping only will be needed in general. This work has been started using mechanised equipment and will be spread over six years. An official inauguration of the improved service took place in May, 1954.

B.S. 2464: 1954 FOR HOSE COUPLINGS.—This is a new British Standard for petrol, and lubricants, and applies to the reduced bore type of couplings and adaptors for $\frac{1}{4}$, 1, 1½, 2, 2½, 3 and 4 in. hose for use at pressures not exceeding 100 lb./sq. in. Two forms of screw threads have been specified for the couplings: Whitworth (B.S.P.) threads in accordance with B.S. 84 and American threads in accordance with ASA specification B.33.1 ($\frac{1}{4}$ in. to 2 in.) and with Federal Standard Stock Catalogue ZZ-H-466b (November, 1935) (2½ in. to 4 in.). Details of these American hose coupling threads are given in the appendices. These latter threads have been specified to ensure

that the couplings connect with oil equipment screwed in accordance with API STD. 5L and 6A. The couplings may be secured to the hose by clamps, by clips, or by other suitable means. This standard deals with materials, dimensions, workmanship, marking and hydrostatic testing of the couplings. Copies of this standard can be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1. Price 7s. 6d.

PHOTOELASTICITY COURSES.—Two courses on photoelasticity are to be given at University College, London. The principles and methods of photoelasticity will be dealt with

in the first course, which will consist of 12 lectures and demonstrations on the theory of photoelasticity and the practical application of photoelastic methods to the investigation of two-dimensional stress distributions. This course will start on October 11. The second course will be concerned with photoelastic methods in three-dimensional distributions. It will consist of 12 lectures and demonstrations on recent developments in the photoelastic investigation of three-dimensional stress problems, and will start on January 31, 1955. Students wishing to attend these courses should communicate with the Secretary, University College, London, Gower Street, W.C.1.

Electronic Arc Suppression in Traction Rectifier

Equipment for substation supplying Sydney suburban services of New South Wales Government Railways

RAPID housing development in the Sydney area has brought heavier suburban traffic to the New South Wales Government Railways, with consequently increased demands on the fixed installations supplying the 1,500-V. d.c. electrified system. In the course of adapting substations to meet these conditions, a pumpless steel tank mercury arc rectifier equipment embodying the latest practice in high-speed electronic arc suppression methods has been installed at Sefton, on the Sydney sub-

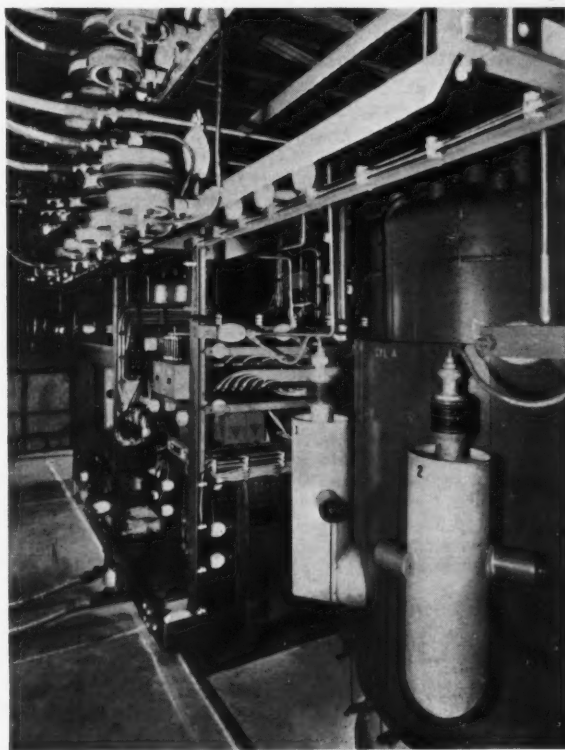
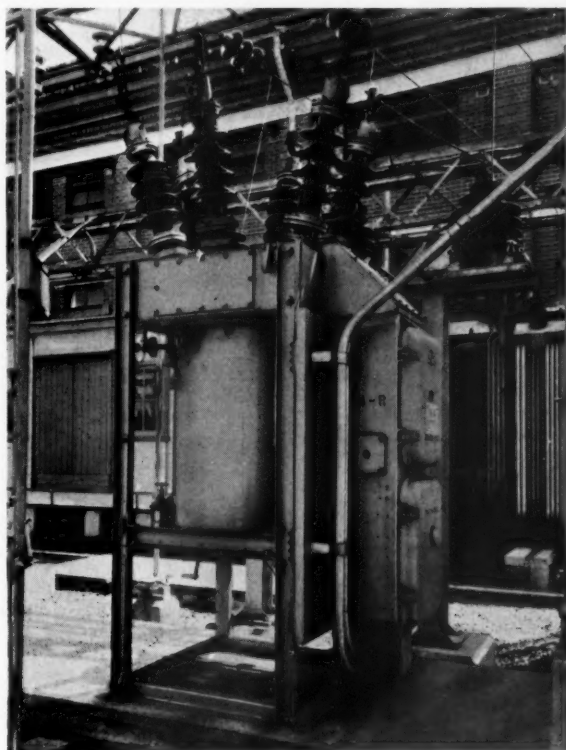
of 400 amp. and a breaking capacity of 500 mVa.

The rectifier transformer is also of the outdoor type, and is fitted with an off-circuit tapping switch which enables primary tapplings of 32.35, 31.5, 30.65 or 30 kV. to be selected. The transformer connections are delta/double six phase, double star, the star points of the appropriate secondary windings being linked by separate interphase transformers mounted in the main tank. A 230-V. tertiary winding is also pro-

vided on the main transformer for energising the rectifier auxiliaries.

No-load loss for the complete equipment is less than 11 kW. After continuous operation on full load in an ambient temperature of 40° C., the rectifier will withstand overloads of 50 per cent for 20 min., 100 per cent for 3 min., 200 per cent for 1 min., and 300 per cent for 5 sec.

The rectifier equipment is fitted with electronic arc suppression apparatus which, on the occurrence of a fault,



(Left) High-speed oil circuit-breaker of G.E.C. rectifier equipment at Sefton substation; (right) the twin-cylinder rectifier and electronic arc-suppression apparatus

urban section of the railway. The equipment was supplied by the General Electric Co. Ltd.

Of the maximum hour loading of approximately 58,000 kW. on the suburban system, some 18,000 kW. is supplied by mercury arc rectifiers, and the remainder by rotary converters. At the Sefton substation the G.E.C. rectifier equipment has an output of 1,500 kW., and is designed to operate in parallel with other rectifiers in the same substation. The incoming 33-kV., 50-cycle, a.c. supply to the rectifier transformer is controlled by means of an outdoor oil circuit-breaker with a current rating

provided on the main transformer for energising the rectifier auxiliaries.

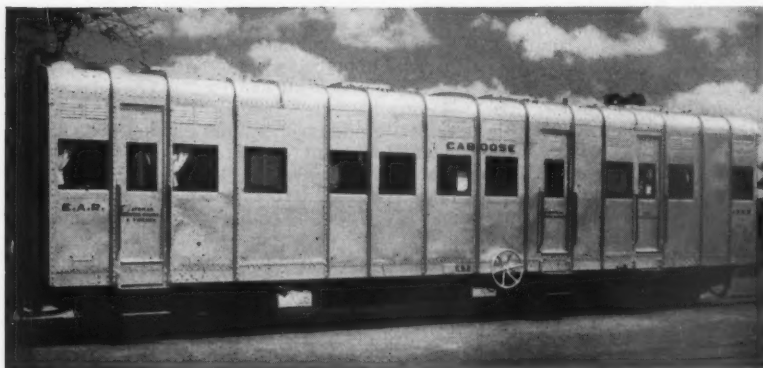
The rectifier is a twin-cylinder equipment; each cylinder is fitted with six side-arm main anodes and control grids, and with three auxiliary anodes. Cooling is effected by a motor-driven fan mounted below the cylinder, the speed of the fan motor being automatically controlled by means of a saturable reactor. Surge diverters of the carbondum disc, multi-gap type are provided in each anode circuit. The output voltage of the rectifier ranges from 1,458 V. at twice full load to 1,579 V. at half load, the power factors of

causes a strong negative bias to be applied to all the control grids, thus preventing any further output of current from the rectifier. The apparatus is actuated by three current transformers in the a.c. supply lines to the rectifier transformer; the secondary windings of the current transformers are connected in open delta, and though no system frequency voltage is present across the open ends, a voltage of triple frequency will appear due to saturation of the transformer cores.

This triple-frequency voltage is applied to the control grids of a pair of
(Continued on page 266)

East African Railways Reconstructed Rolling Stock

Nairobi Workshops undertake a large programme of conversion of bogie and unit wagons



Covered goods bogie wagon converted at Nairobi Workshops to provide running staff accommodation

TO meet increasing needs for various types of rolling stock the East African Railways & Harbours are carrying out the conversion of bogie covered, and also unit wagons. In addition the workshops are also constructing inspection cars. In 1951 a number of covered goods bogie wagons were converted into brake vans which were designed to afford accommodation for relief crews on long distance trains.

The converted covered goods bogie wagons comprise separate compartments for drivers, firemen, and guards, and contain bunks, toilets, and also cooking facilities. Of the 31 wagons so converted 14 were placed in service in Tanganyika, and the remainder in Kenya and Uganda; a further 31 are being converted to the same design.

Similar conversions of rolling stock have taken place with the object of providing accommodation for engineering crews while on construction or maintenance work. Ten of these were placed in service during June. In view of the large numbers of staff involved a dispensary is provided in each coach. A

number of out-moded horse-boxes have also been converted for transporting pigs and replaced by a new type which were designed and constructed in the Nairobi workshops.

Inspection Cars

Altogether some 42 unit inspection cars have been designed and constructed in the Nairobi shops within the past few years. In 1950 a prototype inspection car was placed in service. Subsequently, 15 were placed in service on the Central Line in Tanganyika, and a further 26 bodies are completed and waiting for the delivery of underframes. New construction also includes two restaurant cars, which were built on existing underframes. The previous cars were involved in an accident near Kipkabus Station in 1950.

One of the largest conversions undertaken at Nairobi is the building of 36 insulated bodies on wagon underframes. The rolling stock is designed for the conveyance of butter and chilled meat. The bodies consist of an inner shell of galvanised steel plate, and an outer one

of mild steel sheet. Approximately six inches of space is arranged between the outer and inner shells which is filled with an insulating material. The conversion of a further 17 is contemplated.

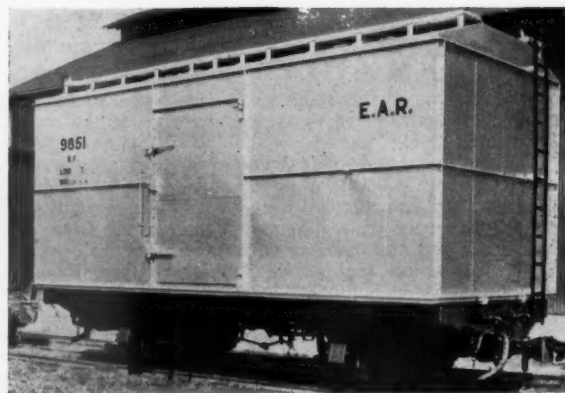
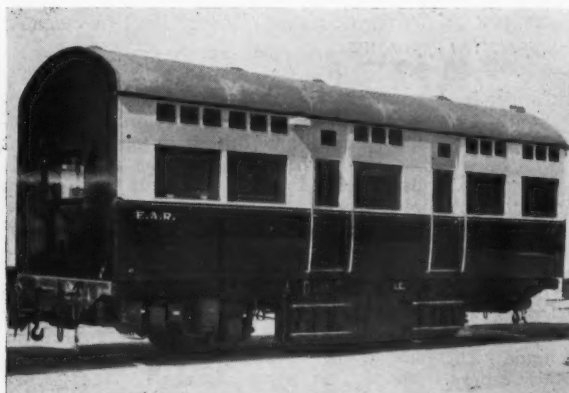
It is also intended to construct the bodies of a quantity of brake vans in the workshops as a result of the satisfactory behaviour in service of a prototype brake van. Arrangements are in hand to build 55 of these vehicles, the first ten of which have been taken in hand. To provide for additional rolling stock for the conveyance of perishable goods 11 covered bogie goods wagons were converted during the earlier part of this year. The side panels were provided with ventilation, and the roofs were insulated. The administration estimate than a saving of some £150,000 has been realised by undertaking this work locally.

Electronic Arc Suppression in Traction Rectifier

(Concluded from page 265)

thyatron valves through a single-phase isolating transformer. When either the positive or negative peak of the signal voltage exceeds the negative bias of the associated thyatron, triggering occurs and causes negative bias to be applied to the grids of the main rectifier. Thus arc suppression is initiated immediately the current in any phase of the a.c. supply exceeds a predetermined value.

If repeated faults occur in the external circuit, the arc suppression apparatus will function for three successive operations, after which the rectifier will be automatically locked out for a predetermined time. Another feature of the protective circuit is that, in the event of a failure in the negative bias supply to the control grids, the main oil circuit-breaker is tripped.



(Left) Unit inspection car, and (right) completed insulated wagon for the conveyance of butter and chilled meat

The Norwegian Railway Centenary

One hundred years of development in a mountainous country of large distances with a small population and limited financial resources

By H. E. Stokke,

General Manager, Norwegian State Railways

ONE hundred years ago most people thought it impossible to build railways in Norway. Nature, they said, offered too much resistance. At that time it seemed fantastic even to dream of broad, level highways instead of the bumpy roads winding up and down the mountain slopes, often interrupted by streams or lakes where boats had to be used.

These difficulties of communication had prolonged provincial isolation in Norway. The influence of the capital, Christiania (now Oslo), on the south coast did not reach far. Thus trade with northern Norway was monopolised by Bergen. That important town on the west coast was separated from eastern Norway by great mountain ranges. The journey from Bergen to London or to Hamburg was shorter than that to Christiania. The important fisheries along the west coast could not be used for the benefit of the country as a whole. It was clear that the economic life of the nation would be restricted as long as its several regions were not connected by modern communications.

The building of roads and railroads in Norway has demanded great engineering skill and expenditure of vast sums of money. So far, some Krone 2,000 million, or £100 million, is estimated to have been invested in Norwegian railways. The task will never be completed; demands for new railways and for modernisation of existing lines will always arise. Today further electrification is a major consideration. Enough, however, has been done to give modern Norway a solid framework of railway communications. The railways have played their part—which is not always recognised—in making Norwegians the united, prosperous people for whom nineteenth-century poets and politicians hoped.

Heavy Engineering Works

The railway system now consists of 2,680 miles of standard-gauge track, of which about 700 miles are electrically operated, and 142 miles of narrow gauge track. The highest points are on the Bergen line (4,270 ft. above sea level at Fagernut) and the Dovre railway (3,415 ft. above sea level near Hjerlenn). There are 300 bridges (total length nearly 21 miles).

The total number of tunnels is 719. Of these, 270 are between Oslo and Bergen. The longest tunnel in Norway is the 5½-mile Kvineshei Tunnel on the Sørland Railway. There are many miles of track on the mountain sections protected by snow screens or in snowsheds.

From the travellers' point of view this is all very satisfying. There is always something to look at; mountain slopes rising to heaven, glimpses of thrilling

On the occasion of the centenary of the Norwegian State Railways, I wish to send greetings to our colleagues in the United Kingdom.

There has existed from the very beginning of our railways a very close contact between Britain and Norway, as regards both building and operating them. This contact may no longer be as intimate as it was 100 years ago, but even today there is real co-operation between the railway managements of our two countries. We feel ourselves naturally tied to Britain.

Among the symbols of a friendship which we value so highly is the portrait bust of G. P. Bidder, engineer of our first railway, generously donated by Mr. C. E. R. Sherrington, of the British Transport Commission, and presented by him to me in the offices of *The Railway Gazette* last May. The bust has been placed in the board room in the head-quarter offices of the State Railways in Oslo, where it is a visible reminder of the traditional friendship and collaboration between our two countries.

precipices, foaming rivers following the track or thundering beneath the bridges. The engineers had other views.

The Beginning of Railways

The question of constructing a railway between Oslo and Eidsvoll—a distance of 42 miles—came up for discus-

sion about 1840. In 1845, the Norwegian Government appointed a special railway commission, and about the same time the British Consul-General in Norway, Mr. John Rice Crowe, applied for a concession to build a railway over this section. He invited Robert Stephenson to come to Norway and investigate the possibilities of this scheme. Stephenson considered it possible to build the line and proposed that the Norwegian Government and British financiers should do so jointly.

This offer was accepted by the Norwegian Parliament (Storting) in March, 1851. Robert Stephenson, who had valuable experience of railway building in England, directed personally the construction of this our first railway, which was officially opened on September 1, 1854. The first Traffic Manager was an Englishman, S. B. Shaw, who occupied this post until 1859.

A British engineering firm had contracted for the work on a basis of sharing the costs with the Norwegian Government, and many were afraid of the influence this would give to foreigners. Public opinion, however, was all for the project, and there was much rejoicing in the streets of Oslo when the decision was proclaimed. The British firm soon got into financial difficulties and when the line was opened in 1854, one year later than had been planned, it was not in very good condition.



[Photo]

[A. Earle Edwards

Three-car electric units in Bergen Station; (left) train to Nesttun and (right) to Trengereid

The first railway was, however, considered a great event. Contemporary accounts show that the country was afflicted by a railway mania. In the period 1857-69 nine small lines were built, comprising above 250 miles, at a cost of Kr.25,000,000, a great sum at that time. The Oslo-Eidsvoll line had proved that no private firm could bear the economic burden of building railways in Norway; from now on, the railways were financed mainly by the State, even though the communities concerned contributed by taking shares. As the regular national budget could not cover such extra expenditure, loans had to be raised.

The first State railways were situated mainly in the south-east corner of Norway, the least mountainous, and also the most enterprising district. They

connected Oslo with the rich valleys around the city and with the Swedish frontier. A very isolated piece of railway was that opened in 1864 between Trondheim and Støren, but it awakened many hopes in northern Norway.

Construction after 1870

All through the 1870s the struggle for provincial railway interests continued, but some greater schemes emerged. The northern districts and the west coast were linked with Oslo through the connection of the Trondheim-Støren and Oslo-Eidsvoll lines. Bergen got its first railway eastwards; progress was slow, and the line stopped at Voss in 1883, but the people of Bergen were determined that it should eventually cross the mountains.

These lines and some others completed

in the 1870s all proved more expensive than expected. The national debt reached Kr.80,000,000 at the beginning of the '80s and continued to rise, which brought railway planning to a standstill. In the '90s work was continued.

By that time the network around Oslo was fairly adequate. As to the Oslo-Bergen and some other important schemes, in 1894, Parliament decided on a compromise involving further construction of short sections of line. One of these, however, was a continuation of the line from Bergen as far as Taugevatn, 4,270 ft. above sea level, and it would have served no purpose for the line to terminate there. The engineers had begun their battle with some of the most formidable mountain passages in Norway.

National Plan for Railways

In 1908, Parliament decided on the first real long-term railway plan covering all Norway. The total cost was estimated to be Kr.30,000,000, but the first world war and new demands by the trade unions soon upset calculations. In 1939, the sum was well over Kr.200,000,000. Today the State railways receive about Kr.350,000,000 a year to cover working expenses. In the period 1945-50 nearly Kr.100,000,000 has been invested by the State in new lines, buildings, and rolling stock and equipment, and Kr.60,000,000 has been spent on modernisation. Electrification during this period cost Kr.46,000,000.

Even although financial calculations of the 1908 plan have been upset, the principles have proved sound. They gave the basis of the railway system Norway has today.

Oslo-Bergen Railway

Bergen and Oslo were finally connected by rail in 1909. The economic life of the districts along the line—many of them formerly some of the most isolated valleys in Norway—has been greatly stimulated. Those who predicted that tourists would be afraid of the mountain journey through regions of perpetual snow were proved wrong; as a tourist attraction, the Bergen railway is of international renown. At present the line is being shortened by means of new tunnels between Voss and Bergen, and electrification is only a matter of time.

The Dovre railway was completed in 1921. It afforded a better connection between Oslo and Trondheim via Eidsvoll, Hamar, and Dombas. In economic importance and as a tourist attraction it rivals the Bergen line. The so-called Rauma railway, which connects Dombas with the west coast and some of the most popular touring districts, was opened in 1924.

After many conflicts and disappointments the Sörland railways now follow the south coast from Oslo to Stavanger through Kristiansand. It was completed during the German occupation, and this has impeded the original plan of electrification.

The districts north of Trondheim had to wait long for their railway. In 1929,



The railways of Norway, showing progress made in construction of the line to Bodø, and in electrification, and (inset) the Ofoten railway

the track had been laid as far as Grong in the Mountains of Namsos with which it was later connected. Now the Nordland railway has passed the Arctic Circle and stops at Lønsdal. When the line has been continued as far as Bodø, the distance by rail thence to Oslo will be 800 miles.

Ofoten Railway

Northern Norway has another railway line with a history all by itself: the Ofoten line, the northernmost railway in the world. It was built during the period of political union between Norway and Sweden to connect the Swedish mining towns Gällivare and Kiruna with the harbour of Narvik, in Norway. The work was started in 1885 by a British firm, which had to relinquish the contract before long. The Swedish and Norwegian Governments took over, and when the railway was opened in 1903, the cost had been Kr. 9,000,000. Its strategic importance caused it to play a prominent part during the war of 1939-45.

In building all these railways, Norwegian engineers and workmen have completed many tasks that seemed impossible. Methods used in other countries often proved ineffective in conditions obtaining in Norway; but the difficulties which were met were overcome.



Photo]

[A. Earle Edwards

One of three 1-D-D-1 locomotives built by A.S.E.A. and A.B. Motala Verkstad, at Katterat, working P. & O. cruise special from Narvik to Abisko, in Sweden

Nature, however, is never finally conquered. She still threatens the work of men by creating avalanches, snowstorms, and floods. The staff of the Norwegian State Railways has many

duties in combating these assaults of nature. In winter time, the Bergen railway alone needs a special group of 25 men fighting the snow. Rotary snowploughs and other devices are needed to keep the line open.

The building and running of railways in Norway is a costly business. It can never pay dividends in cash. If our railways had to make profit, as the former General Manager of the State Railways, the late Mr. Egil Sundt, once said, there would be no railways in Norway; but, he added, the geographical factors and the needs of a small population scattered over a large area give our railways many important functions beside the purely economic. These social and cultural functions are great enough to pay dividends in their own manner.



Characteristic scenery on the Valdres line between Leira and Fagernes

RANSOMES & RAPIER EXHIBITS AT THE BAGHDAD TRADE FAIR.—Ransomes & Rapier, Limited, will display, through their Iraq agent, a comprehensive range of equipment at the British Industries Fair to be held at Baghdad from October 25 to November 8. The equipment will include a Rapier 5 super mobile crane for loads up to 15,000 lb. The crane is diesel-electrically operated, with separate motors for travel, slew, hoist, and derrick. Pneumatic tyres are fitted, together with a patented self-steering giving effortless control and rapid manœuvring with a 90 deg. steering lock. This feature enables the crane to revolve on its road wheels about the centre point of the front axle, in addition to the independent full slewing of the superstructure. A petrol-electric drive, and solid rubber tyres are offered as alternatives. Other exhibits as models, will be displayed, which includes a Rapier 6 standard mobile crane, a Rapier shop truck crane, a range of Rapier excavators from ½ cu. yd. capacity upwards, together with a model of the Wadi Tharthar Barrage gates.

The Norwegian Railway Centenary



Goods train near Stanghelle, between Bergen and Voss, on the Oslo main line



Photo]

[K. Westcott Jones

Myrdal Station, 2,900 ft. above sea level on the Oslo-Bergen line, showing Flam branch electric train

RAILWAY NEWS SECTION

PERSONAL

The following appointments to the British Transport Commission have been announced:—

Mr. A. B. B. Valentine, M.Inst.T., until his new appointment a Member of the London Transport Executive, has been appointed a full-time Member.

Lt.-Colonel D. H. Cameron of Lochiel, T.D., a Chartered Accountant and a County

We regret to record the death on August 28, at the age of 89, of Sir Henry Allan Holden Steward, T.D., formerly Chairman of the Light Railway Commission. Sir Henry Steward, who was called to the Bar by the Inner Temple in 1890, published a standard work, *Law of Light Railways*, in 1896, and in the course of the ensuing years he was appointed Secretary of the Light Railway Commission, of which he was Chairman from 1918 to

The Minister of Transport & Civil Aviation has appointed the undermentioned persons to serve as Members of the new Transport Users Consultative Committee for the West Midland Area:—

Mr. J. Delicate (representing Industry and Commerce), Mr. G. G. Beazley (representing Shipping), Councillor Colonel E. C. L. Bearcroft (representing Local Authorities) and Mrs. E. Bayliss, J.P. (additional member).



Mr. H. E. Stokke
Director-General,
Norwegian State Railways



Dr. L. Douglas,
Appointed Chief Mechanical Engineer,
South African Railways

Councillor for Inverness-shire, has been appointed a part-time Member of the Commission.

Mr. H. E. Stokke, Director-General of the Norwegian State Railways, which celebrates its centenary this year (see the article on page 267), was born on November 20, 1900. After holding a number of public positions he became Counsellor in the Ministry of Public Works in 1945, and Personal Secretary to the Minister of Communications in the following year. In 1947 he became Under-Secretary of State for Communications, and he was elected Mayor of Oslo in 1948. He was appointed Director-General of the Norwegian State Railways on September 17, 1950. On the occasion of his fiftieth birthday Mr. Stokke was awarded the King's Gold Medal of Merit.

Mr. John Hossack, Deputy Chief Engineer (Projects), Rhodesia Railways, has retired.

1922. He was Clerk of the Railways Amalgamation Tribunal in 1912, and Chairman of the Tramways Charges Advisory Committee in 1920.

Mr. Alexander McDonald, B.Sc., M.I.C.E., has been appointed Secretary of the Institution of Civil Engineers.

Mr. C. Scutt, Assistant District Motive Power Superintendent, Worcester, Eastern Region, British Railways, has been appointed Assistant District Motive Power Superintendent, Cambridge, Eastern Region.

The following appointments have been announced by London Midland Region:—

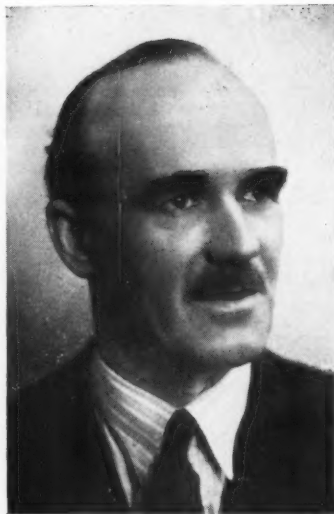
Mr. C. J. North to be District Motive Power Superintendent, Kentish Town.

Mr. D. A. Paterson to be Engineering and Signal & Telecommunications Accountant, St. Pancras.

Mr. P. J. Fisher to be Assistant (Freight Services), Operating Superintendent's Department, Euston.

Dr. L. Douglas, formerly Assistant Chief Mechanical Engineer (Workshops), South African Railways, who, as recorded in our March 12 issue, has been appointed Chief Mechanical Engineer of the system, joined South African Railways as a Pupil Mechanical Engineer at Uitenhage on September 1, 1925. After progressing through various grades he was appointed Locomotive Superintendent at Pretoria in 1937. Dr. Douglas became Advisory Engineer, Washington, in 1943, and, in 1945, he was transferred to London in the same capacity. On January 27, 1948, he was appointed Assistant Chief Mechanical Engineer (Workshops) in Pretoria after having served as Mechanical Engineer (Workshop Layouts) for nearly two years.

We regret to record the death, at the age of 86, of Mr. Winthrop K. Howe, formerly Vice-President in charge of engineering of the General Railway Signal Company. Mr. Howe was a member of the Institution of Railway Signal Engineers.



Mr. J. W. Dedman,
Appointed Assistant Divisional Operating
Superintendent (Western), Eastern Region



Mr. P. J. Fisher,
Appointed Assistant (Freight Services),
Operating Superintendent's Department, L.M. Region



The late Mr. W. D. Havelock,
District Commercial Superintendent,
Hull, North Eastern Region, 1952-54

Mr. J. W. Dedman, M.Inst.T., District Operating Superintendent, Cambridge, Eastern Region, who, as recorded in our August 27 issue, has been appointed Assistant Divisional Operating Superintendent (Western), Liverpool Street, Eastern Region, joined the North Eastern Railway in 1917 at Norton-on-Tees. After serving at various stations on Tees-side, he was transferred to the District Goods Manager's office, Middlesbrough, and, in turn, to the Goods Manager's office, York, and the Divisional General Manager's office, York, where he was Personal Clerk to the Divisional General Manager from 1926-28. Thereafter, Mr. Dedman was transferred to the Chief General Manager's office, Kings Cross. In 1930 he returned to the North Eastern Area, working successively at York, Hull, and Darlington, where he was Chief Clerk (Staff) from 1932 to 1937 in which year he became Assistant Goods Agent, Newcastle (Forth). In the following year, he was appointed to the Superintendent's office, York, where he remained until 1942, when he took up the appointment of Assistant District Superintendent, Edinburgh. In 1946, Mr. Dedman was appointed Assistant District Superintendent, Glasgow, and, in February, 1949, he became District Operating Superintendent, Southend District (Eastern Region). In April, 1950, he was appointed District Operating Superintendent, Cambridge. Mr. Dedman is Chairman of the Cambridgeshire, Bedfordshire & Huntingdonshire Section of the Institute of Transport, and has lectured on railway operating to railway students at Glasgow and Edinburgh Universities.

Mr. D. B. Ashworth has been elected a Director of the A.B.C. Coupler & Engineering Co. Ltd.

Mr. G. H. Passey has been appointed Diesel Traction Engineer to British United Traction Limited, and will be responsible for the design and development of B.U.T. diesel trains and other associated equipment. He was previously Assistant Engineer (Railcar), A.E.C. Limited, Mr. F. Hodgkinson, also previously of A.E.C., has joined B.U.T. at Borehamwood. He will be responsible for all sales inquiries and technical specifications.

Mr. P. J. Fisher, District Operating Superintendent, Liverpool (Lime Street), London Midland Region, British Railways, who, as recorded elsewhere in this section, has been appointed Assistant (Freight Services), Operating Superintendent's Department, London Midland Region, began his railway career on the former L.M.S. in 1928. After gaining experience at various stations and in the staff office at Derby he served on a shunting analysis committee for the Western Division, later becoming Assistant Signalmen's Inspector at Bangor. Appointment to a similar position at Willesden followed, after which Mr. Fisher became a Runner at Euston. He was appointed Assistant District Controller, Peterborough in 1936 and two years later moved to a similar post at Rugby. During the 1939-45 war he joined H.M. Forces in the Royal Engineers and served in railway operating units in France in 1940, later attaining the rank of Lieutenant-Colonel and serving in West Africa, Italy and South East Asia. On his return to railway service in 1945 Mr. Fisher was appointed Assistant District Operating Manager, Liverpool, and, a year later, he became District Operating Manager, Rugby. In 1947 he was appointed District Operating Manager, Liverpool (Lime Street). This position, which he now leaves, was redesignated District Operating Superintendent, Liverpool (Lime Street) the following year.

Mr. P. R. Dunn, B.Sc., M.I.E.E., has been appointed Chairman of the Mersey & North Wales Centre of the Institution of Electrical Engineers. Mr. Dunn is Deputy Chief Engineer of British Insulated Callender's Cables Limited.

The Yorkshire Engine Co. Ltd., a branch of the United Steel Companies Limited, announces that Mr. J. E. Bagguley, M.I. Loco.E., will be appointed Works Manager of the company as from September 9. Mr. Bagguley, who is at present General Production Manager at the Distington Engineering Co. Ltd., was formerly Technical Consultant at the Indian Government's Locomotive Works at Chittaranjan. On the same date Mr. R. Lancaster, Works Manager, becomes General Works Manager at the Distington Engineering Co. Ltd.

We regret to record the death on August 23, at the age of 47, of Mr. W. D. Havelock, O.B.E., District Commercial Superintendent, Hull, North Eastern Region, British Railways. Mr. Havelock, who was born in Alston, Cumberland, began his railway career in May, 1923. After serving at a number of stations in the Newcastle area he was appointed Assistant Goods Agent, York, in August, 1938. He held various appointments at Hull and York until August, 1943, when he was seconded to the Colonial Office and served as Port Manager at Takoradi, on the Gold Coast, and Sierra Leone. On his return he was employed in the Divisional General Manager's office at York, was appointed District Goods Manager, Leeds, in August, 1947, District Goods Superintendent, Wolverhampton, in September, 1950, and District Commercial Superintendent, Hull, in April, 1952. He was awarded the O.B.E. in 1945.

Cremation took place at Lawnswood, Leeds, on August 25. The service was attended by a number of colleagues and friends, including Messrs. C. E. Douthwaite (representing S.P.D. Limited, York), A. A. Harrison (representing Messrs. David Blew, D. Murray, J. R. Pike, J. E. M. Roberts, all of the British Transport Commission, and E. W. I. Arkle, Commercial Superintendent, London Midland Region).

British Railways, York

Messrs. F. Grundy, Commercial Superintendent (also representing Mr. H. A. Short, Chief Regional Manager), J. Sneddon, Assistant to Commercial Superintendent (also representing Mr. H. F. Sanderson, Assistant Commercial Superintendent), A. Blackburn, Commercial Superintendent's office, J. E. Richardson, District Commercial Superintendent, York, D. F. Gowen, Assistant to Chief Regional Manager, H. M. Lattimer, District Operating Superintendent, B. A. Coulson, Traffic Costing Officer.

British Railways, Hull

Messrs. W. G. Thorpe, District Operating Superintendent, Hull, M. F. Dyer, Acting Assistant District Commercial Superintendent, Hull (also representing Mr. J. L. Barton), Acting District Commercial Superintendent, Hull), A. S. Franks, S. Newton, H. Ponton-Brown, H. Walton,

Miss M. Shepherd, Miss M. Bolton, all of District Commercial Superintendent's Office, Messrs. W. J. M. Daymond, Goods Agent, Hull, S. Denton, Passenger & Parcels Agent, A. J. Boardman, Traffic Agent, Goole, Messrs. T. Brown, A. B. Silvester, W. H. Dunderdale, W. E. Lawson, G. B. Milson (retired staff).

British Railways, Leeds

Messrs. T. R. Heaton, District Goods Superintendent, D. Hill, District Passenger Superintendent, J. R. Penzer, Assistant District Passenger Superintendent, Messrs. S. Stockhill, J. Lancaster, Miss M. Everitt, Miss G. M. Newton, Miss M. Jepson, Mrs. R. Scott, Mrs. F. Bradshaw, all of District Goods Superintendent's office.

British Railways, Newcastle

Messrs. L. Ballan, District Goods Superintendent, S. Cott, District Passenger Superintendent.

British Railways, Middlesbrough

Messrs. K. A. Kindon, District Commercial Superintendent, C. Corps, retired District Commercial Superintendent.

British Railways, Cambridge

Mr. A. J. Johnson, District Commercial Superintendent, Cambridge.

We regret to record the death on July 27 of Mr. Wilson Harvey, a Director of Andrew Barclay Sons & Co. Ltd.

Mr. T. R. Swift has been elected a Director of Powers-Samas Accounting Machines Limited, and appointed Managing Director (Production) of the company.

Mr. E. H. Jerrett, General Manager of the Cambrian Wagon & Engineering Co. Ltd., has been appointed to the board of that company.

We regret to record the death on August 27, at the age of 59, of Colonel Harold Bantock Sankey, C.B.E., M.C., T.D., a Director of Guest, Keen & Nettlefolds Limited.

Long Welded Rails in Switzerland

During the past year the Swiss Federal Railways have been laying rails 900 m. in length between Ettoy and Allaman on the Lausanne-Geneva main line. This section carries the fastest trains in Switzerland, including bookings over the 37.4 miles between Lausanne and Geneva in 34 min. start to stop, which demand sustained speeds up to 80 m.p.h. When this line was opened, the original rails were 6 m. long and weighed 35 kg. per m.; by 1904 rails 12 m. long and 46 kg. per m. had come into use, replaced in 1937 by 24 m. rails. The 46 kg. per m. (92 lb. per yd.) weight still remains, but with the aid of welding the length has now increased to 900 m. (2,952 ft. 9 in.).

Preliminary experiments by the Swiss Federal Railways with welded rails of lesser length had shown that, given sufficiently secure holding, expansion and contraction could be confined to the rail-ends. It was then decided to relay the tracks in both directions between Ettoy and Allaman, over a length of 2,600 m., with twelve rails of from 800 to 900 m. in length, welded from 36 m. lengths by both electric butt-welding and aluminothermic methods. This work was carried out at a special depot at Allaman. In one track the rails have been laid on timber sleepers, and in the other on concrete sleepers, for comparison. The

particular section of line was chosen as being practically straight, for it is felt undesirable to lay rails of this length in any curve having a shorter radius than 800 m.

As during the daytime this main line carries trains at approximately 20-min. intervals, complete possession of either track, with single-line working over the other, could be obtained at night time only. A period of the year was chosen, between September 3 and November 20, 1953, when it was possible to lay the rails in at a temperature of approximately 60 deg. F. Before the laying, the ballast had been cleaned by a Swiss machine of the Scheuchzer type, which dealt with 200 m. of single track each night that it was at work.

The end of each long rail has been planned to a point, and the points of adjacent rails are brought together in a long diagonal joint, which allows a maximum longitudinal movement, of the two rails combined, of 18 m. The joints are supported by two pairs of specially designed long angle fishplates, carried on wide baseplates and timbers, in place of ordinary sleepers, and the two joint sleepers and the adjacent sleepers on either side are further secured by a pair of longitudinal channels in the four-foot, bolted to them.

Presentation to Mr. W. E. Blakey

At the Great Eastern Hotel, Liverpool Street, London, E.C.2, on August 5, Mr. W. E. Blakey, M.B.E., M.M., Assistant Commercial Superintendent, Eastern Region, who retired from the service on July 30, as recorded in our August 6 issue, was presented with a cheque by Mr. C. K. Bird, Chief Regional Manager, on behalf of the officers and District officers of the Eastern Region. Mr. C. G. G. Dandridge, Commercial Superintendent, Eastern Region, who presided, and other officers present, spoke of Mr. Blakey's long railway service and sterling qualities.

A further presentation was made to Mr. Blakey on August 18, when Mr. Dandridge

handed to him a gold wristlet watch suitably inscribed on behalf of the staff in the Commercial Superintendent's Office.

Public Visits to N.E. Region Rolling Stock Works

To celebrate the centenary of the North Eastern Railway, which was formed on July 31, 1854, British Railways, North Eastern Region, on July 28, at Darlington opened to the public the North Road Locomotive Works, the Stoopdale Boiler Shop, the Faverdale Wagon Works, and the Shildon Wagon Works; at Walker Gate, Newcastle, on the same day the carriage and wagon works were on view; and on August 11, the carriage and wagon works at York were open to visitors.

Over 21,394 people accepted the invitation given to them through the editorial columns of their local newspapers, 11,500 visiting Darlington North Road and 4,400 York Carriage & Wagon Works.

Construction of B.R. Standard Locomotives

At Darlington North Road visitors were shown some of the present order of 35 British Railways standard class "2" steam locomotives and diesel-electric shunting engines in various stages of construction.

At Shildon Wagon Works, on a site associated with railways since the first colliery railways were laid down, visitors saw how the staff of 3,100 build 10,000 wagons a year and repair 43,000.

Wagon bodies seen under construction at Faverdale Wagon Works included insulated fish vans, standard 12-ton covered goods, and standard goods brake vans. Faverdale also builds highly-insulated containers, insulated meat containers, furniture containers, and 12-ton pallet vans.

At York Carriage & Wagon Works the public were shown the new carriage building shop, and the building of all-steel coaches to British Railways new standard designs, of which the works produces five a week. The 500-ton press attracted considerable attention.



Mr. W. E. Blakey (left) being presented with gold watch by Mr. C. G. G. Dandridge

Ministry of Transport Accident Report

Longniddry Junction, December 17, 1953; British Railways, Scottish Region

Colonel D. McMullen, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 1.18 a.m. on December 17, 1953, at Longniddry Junction, when the 12.41 a.m. up special parcels train, Edinburgh to Kings Cross, consisting of 9 bogie and 19 4-wheeled vans drawn by a Class 7 4-6-2 engine, passing through the station at about 60 m.p.h., became seriously derailed by running into a fabricated "decauville" type track turnout fallen from a down freight train which passed just before. This consisted of 39 vehicles, the first 14 of which had the vacuum brake connected to the engine. The fireman of the parcels train was killed, the driver seriously injured and the guard received bruises and suffered from shock.

The drag box was torn from the engine, which became separated from its tender and thrown over the up platform, resting with its wheels uppermost at the bottom of an embankment turned through 180 deg. The tender was turned right round and, with the engine, heavily damaged. Six of the leading 10 vans were demolished and the remainder seriously damaged. The next three were derailed and damaged to a lesser degree. The up platform was demolished for 123 yd. and much other damage done. Main lines were cleared by 1.15 p.m. and the down line opened again at 4.55 a.m., and the up at 6.22 a.m. the next day. It was a cold clear night.

Course of Events

The parcels train left Edinburgh 7 min. late at 12.48 a.m. and found the Longniddry signals clear. Engine controls were found in working position and the driver clearly had no warning of the obstruction. The freight train had started from Heaton, about 110 miles away in the North-Eastern Region, at 10.3 p.m. on December 16. Its guard spent about half an hour examining it and took particular note of the wagon containing the decauville track as it was next to his van with the load overhanging the end by about 1 ft. and roped. He noticed it was somewhat to one side, but tested the ropes tied to the buffer castings and found them tight. He did not observe how the roping was done nor get up on the wagon to examine. They had a clear run to Tweedmouth without any jerking.

The guard who took over there said they left at 12.6 a.m. The train was "D" class, not scheduled for examination at Berwick, but he walked along it and informed the driver of the load and walked back, looking at the wagons, testing the ropes of several and finding them taut. He remembered those on the one next to the brake were round the buffer castings but did not notice how that had been done. Overhang was central. When they were running about 36 m.p.h. beyond Aberlady Junction he saw sparks flying and from his front verandah saw part of the load overhanging to one side by 1 ft. to 1 ft. 6 in. He applied and released the brake several times but the driver continued running, so he removed the tail lamp and tried to attract the signalman's attention by waving it. Seeing the parcels train approaching, he replaced the lamp and showed a red hand signal towards it. The loose load struck something at the

end of the down platform and rebounded on to the up line, but he could do nothing but keep the brake hard on until they were stopped at Prestonpans on advice from Longniddry. (It was found later that the loose turnout had struck a water column.)

The driver of this train said they had a good run from Berwick; neither he nor his fireman felt any jerking from the guard's brake. His fireman looked back several times and he did so once, but they saw nothing amiss.

The signalman at Longniddry watched this train approach but noticed nothing until it had passed, when he saw its three red lamps and another red light which he took for the guard's hand lamp. He replaced his up signals to danger and sent "stop and examine" forward, but the up train had passed his home signal.

The wagon concerned was an unfitted high sided open one, loaded in the private siding of a firm at Gildersome West on December 14, with 8 pieces of 30 lb. per yd. 2 ft. gauge turnouts weighing 3½ tons, within the permissible figure. The rules involved dated from the former L.N.E.R. and prescribed two ropes for securing the overhang, first secured to the load itself and then double roped round the buffer castings, being finally secured to a diagram provided with the rule. It was further required that there should be an additional rope at the centre of the wagon when the load came above its rave there, as this one did by some 10 in.

The load was roped by a porter, aged 21 with 4 months service, under instructions from a foreman, standing by. He said he used one rope of full length nearly new and described to Colonel McMullen how he passed it round and braced it across, without any packing between it and the rails, as he had been told to do and had done once before. He put no rope round the centre of the wagon and did not know when such should have been used.

The foreman said there had not been a load of this kind for some time but 30 or 40 wagons of turnouts had been dispatched southwards earlier in the year. He was uncertain how many times the porter took the rope round the rails, and inspected by feeling it without getting up on the wagon, although the porter declared he had done that. He had not considered packing necessary and thought one rope sufficient to secure the overhang while the rails were not high enough in the centre of the wagon to warrant a second rope. He passed many loads so roped, and had a copy of the instructions, but was unaware that they required two ropes for an overhanging part and specified conditions under which an additional one was to be used. He is 56, with 42 years service, 11 as foreman at this place.

The stationmaster said about 12 wagons were loaded in this siding daily and about the same number regularly roped weekly. In his 16 months there he had seen many loads roped but not one such as this. He did not know that only one rope was being used to secure the overhanging part of a load and a centre one not always put on when the rules required it.

The district inspector also had seen many overhanging loads but not one of this kind. It was his practice to satisfy himself they were safe to travel. Asked to demonstrate on a model he used one

rope only, first tying it round the load to make it solid; he thought this to be normal.

The course of the wagon through the yards was not recorded, but there is no evidence that the load was displaced or re-roped at any point. Had it been "stopped" anywhere the stationmaster would have been advised. At Heaton it was placed in the train for Edinburgh and the examiner said he checked all the ropes of the several vehicles having them, saw they were taut and not chafed, but did not get on the tops of any wagons. He did not notice that this load wanted a centre rope; from the ground he could see only the overhanging portion.

The Glasgow loads inspector examined the wagon soon after the accident and demonstrated how he thought the load had been secured which he did not consider satisfactory. Its pieces should first have been tied together and then secured to the wagon. He thought the rope not long enough, unless a considerable portion was missing. The wagon contained only 7 turnouts; the broken pieces of the eighth were found on the track.

As the rope attached to the wagon was in five separate pieces, Colonel McMullen asked that endeavours be made to reconstruct how the roping was done, a report on which he reproduces. Three pieces were proved to be from a relatively new firm rope, the remainder from a relatively old one, "dry, limp, weathered and abraded."

Inspecting Officer's Conclusions

Once the rope broke, which it did from chafing, the manner in which it was attached allowed the whole of it and the load to become loose. No centre rope had been affixed and the top piece was able to become displaced sufficiently to strike the water column and be thrown on the opposite line. The instructions requiring the use of two ropes had not been obeyed, but the porter is not blamed for that. Whether he used one full length or two ropes tied into one is immaterial. He had been in the service only a short time and had acted as told by the foreman who inspected the roped wagons, an experienced man who cannot be excused for disregarding instructions in this way. It was an error of judgment not having packing between the rails and the rope. Neither the stationmaster nor district inspector had given as much attention to the correct roping of the wagons as it deserved.

The guard at Heaton noticed the load was not central; some movement and possibly some chafing had started by then and it is difficult to accept the fact that all downfalls were tight, as he and the wagon examiner said they found them, and as the other guard alleged they were at Berwick. From Heaton there was probably continuous though slight movement of the load due to vibration, sufficient to cause chafing and final failure of the rope.

The guard who came on at Tweedmouth did his best to attract his driver's attention but presumably the speed, and the 14 tightly coupled wagons next to the engine, with the remaining couplings still tight on the rising gradient, made his efforts ineffective. The brake van probably was closer to Longniddry signal box than the guard imagined when he tried to attract

attention with the tail lamp. Though he did not think of it and cannot be blamed it might have been better had he reversed a side light before trying to attract the driver's attention. The signalman might then have seen the red light at some distance and replaced his up signals sooner.

Remarks

The accident might have been still more serious had a passenger train been involved; it resulted from a responsible member of the staff failing to obey instructions. In a review of loading instructions now taking place the British Transport Commission has accepted the principle that the projecting portion of a load shall be roped so that it will be held securely as far as the next examination point, even if one part of the rope does break from any cause. With some loads two ropes will be required, but with others one might suffice, providing it is properly applied. The correct method in both cases will be clearly explained in the new instructions which will include precautions to be taken against fraying.

Serious accidents can result from movement of loads and it is important that everyone concerned should be meticulous in the examination of those liable to become displaced.

L.T. Route Survey Vehicle

A quarter-of-a-century ago the London General Omnibus Co. Ltd. discarded the hand-operated road measuring wheel in favour of mechanised measurement with a Chevrolet van equipped with speed, time, and distance recording instruments and carrying a collapsible height gauge on its roof.

A proprietary vehicle has now been adapted by London Transport for the purpose, rather than adapt the equipment used, which is basically unchanged. The vehicle is a Bedford 10/12-cwt. chassis with a Martin Walter Utecon body adapted in London Transport workshops. A telescopic mast, which fits into a socket on the near side of the front bumper, takes the place of the trellis work of the former height gauge, and, to enable the operator to watch for obstructions such as low

bridges, a porthole is let into the roof of the cab on the near side.

A desk for the operator carries a Tel-recorder, a gradient gauge, and a clock. A dial above the desk shows the camber of the road; and an instrument which records the distance between any two points is operated by a wheel which can be lowered on to the road surface. An interior heater is provided.

Although intended primarily for bus route surveys, the survey vehicle is suitable for acting as a radio H.Q. car during events such as race meetings, when it conveys radio equipment to the site and then works in conjunction with walkie-talkie sets.

New Santa Fe Service Between Chicago and San Francisco

The long-promised through streamline service of the Atchison, Topeka & Santa Fe Railway between Chicago and San Francisco, named the "San Francisco Chief," came into operation on June 6. Unlike the other principal streamline trains of the Santa Fe between Chicago and the Pacific Coast, the new train does not take the direct route between Kansas City and Gallup via La Junta, but the more southerly main line via Wichita and Amarillo, which serves larger towns.

This route increases the distance covered to 2,547 miles, compared with the 2,261 miles covered by the competing "City of San Francisco" operated jointly by the Chicago & North Western, Union Pacific, and Southern Pacific lines, and explains the difference between the 47½ hours and 40 hours taken respectively by the two trains between Chicago and San Francisco. Though because of this difference the trains may not attract a large number of passengers making the journey throughout, the Santa Fe expects to obtain ample patronage by the direct service that it gives between Chicago and Kansas City and the important towns in the Joaquin Valley, such as Bakersfield, Fresno and Stockton, as well as intermediately.

The formation includes nine cars (sleeping, reclining chair, dormitory-buffet, dining, and a full-length dome-lounge) from Chicago to Oakland Pier (San Francisco); a through sleeper from Chicago to

Phoenix, Arizona; a sleeping car and mail car from Kansas City to Oakland; and, attached at Clovis, a through sleeper from New Orleans and a through reclining chair coach from Houston to Oakland. The full 14-coach formation runs from Clovis to Ash Fork, where the Phoenix car is detached, and 13 cars continue from there to Oakland Pier.

Leaving Chicago at 4 p.m., the "San Francisco Chief" provides a convenient evening service over the 451 miles to Kansas City in 7 hours 50 min., arriving at 11.50 p.m.; Bakersfield is reached at 6.45 a.m. on the third morning, Oakland at 1.10 p.m. on the third day, and San Francisco at 1.30 p.m. Allowing for two hours gained by the change from Central to Pacific time, the journey is one of 47½ hours. In the reverse direction, departure from San Francisco is at 11 a.m. and from Oakland at 11.25 a.m., and Chicago is reached at 12.20 p.m. on the third day, a net total of 47 hours 20 min., requiring an average speed of 53.8 m.p.h. throughout including all stops. Five complete trains are needed to maintain daily service.

London Transport Book of Remembrance

The manuscript of the Roll of Honour, in memory of the 1,298 men and women of London Transport who gave their lives during the second world war, was unveiled on August 19 by Sir Brian Robertson, Chairman of the British Transport Commission, at a dedication service held at 55 Broadway. The book was dedicated by the Venerable Adam Fox, Archdeacon of Westminster, in the presence of past and present members of the staff.

In the book are inscribed the names of 837 staff who lost their lives while serving in the armed forces and 461 killed in this country, in keeping transport services working or in Civil Defence. The book will be kept in the Staff Library at London Transport headquarters and a page turned each day.

The manuscript is illuminated by William M. Gardner, with binding by Sydney M. Cockerell. The book is of vellum leaves. The title page bears a commemorative inscription in burnished gold, headed by the



London Transport route survey vehicle, showing (left) telescopic mast and porthole in cab roof on near side, and (right) operator's desk with recording instruments

London Transport griffin, also in gold, supported by the London Transport bull's eye device in red with blue bar. Binding is in red levant morocco with the London Transport griffin blocked in gold.

London Transport in the War Zone

Unveiling the Book of Remembrance, Sir Brian Robertson said that 24,000 London Transport staff had enlisted in the armed forces during the war, but apart from that, the whole of London Transport went to war, because London itself was in the war zone. Many people had told him that it was the steadiness and sustained good humour of London Transport staff as they went about their daily job which did a very great deal to support the morale of London. They enabled citizens to get to work day after day despite great difficulties and danger.

But for such men and women as those whose names were in this book, the flag of freedom would not be flying over Britain. They were very proud of them and grateful.

Staff & Labour Matters

Railway Wages

Further discussions on the salary and wages structure of British Railways staff took place on August 27 between Sir Brian Robertson, Chairman, and other representatives of the B.T.C., and delegates of the N.U.R. and T.S.S.A. Separate meetings were held with either union.

After the meeting with the Commission, Mr. J. S. Campbell, the N.U.R. General Secretary, said that finality had not been reached, but a reply would be given to the Commission after a report had been made to the N.U.R. executive committee. The N.U.R. executive met on August 31 and decided to refer the matter to the union negotiating sub-committee, which was requested to make a recommendation as to future action to the full

executive committee of the union on September 1.

The T.S.S.A. executive heard a report from its representatives on August 29, and after a full discussion decided to ask for a further meeting with Sir Brian Robertson. Mr. W. J. P. Webber, the T.S.S.A. General Secretary, said that a report on the discussions which the Association leaders had had with Sir Brian Robertson would be made to its executive committee, and it was expected that a further meeting with the Commission would take place in the next few days.

Reference to Negotiating Machinery

The A.S.L.E.F. did not participate in these further talks, as that union had announced its intention to refer its claim to the Railway Staff National Council. This body consists of eight representatives of the unions (four N.U.R., two A.S.L.E.F., and two T.S.S.A.), and eight representatives of the Commission. Failure to reach agreement at the Council would most likely involve the issue being referred to the Railway Staff National Tribunal, the highest stage of the negotiating machinery.

NEW RASKIN INCLINABLE PRESS.—A new, 35-ton inclinable press has been added to the Raskin range, distributed in the United Kingdom by George Cohen Sons & Co. Ltd. Coming between the 20-ton capacity type 20I, and the 45-ton capacity type 45IB, the new machine has been introduced to meet various demands with the Raskin inclinable range, which now offers seven intermediate capacities between the six and 100-ton presses. The new press is suitable for normal piercing, blanking, bending and forming operations, and has provision for the fitting of air cushion equipment for shallow drawing. The machine is manufactured by Les Ateliers H. Raskin, S.A., Belgium.

Contracts & Tenders

An order for 40 24½-ton all-steel mineral wagons recently placed with the Metropolitan-Cammell Carriage & Wagon Co. Ltd. by John Lysaght's Scunthorpe Works Limited has been increased to 80.

The North British Locomotive Co. Ltd. has received an order for two 545 b.h.p. diesel-hydraulic locomotives, with Paxman engines and Voith-North British hydraulic transmission, for the copper mines at Nchanga in Northern Rhodesia.

British Railways, Southern Region, have placed the following contracts:—

Aubrey Watson Limited, London, S.W.1: sheet piling and protection work, bridge over canal, Brentford; reconstruction of Masons Bridge between Fulwell and Hampton

L. & W. Whitehead Limited, London, S.W.9: new substations at Earlsfield and Point Pleasant Junction

J. B. Edwards & Company, Kenley: earthworks and site preparation, Richmond new substation

Mears Bros. (Contractors) Ltd., London, S.E.26: removal of cover of Cane Hill covered way over line between Coudsdon North and Earlswood, and construction of occupation bridge

The Special Register Information Service, Export Services Branch, Board of Trade, states that the closing date for certain items of the Indian Railways Rolling Stock Programme 1955-56 has been postponed as follows:—

All-metal electric multiple-unit coaches, suitable for operation from an overhead supply of 1,500 volts d.c. in the Bombay area, etc.—November 1

Electric locomotives suitable for operation from an overhead supply of 3,000 volts d.c. for Calcutta electrification.—December 1

All-metal electric multiple-unit coaches suitable for operation from an overhead supply of 3,000 volts d.c. for Calcutta electrification, etc.—December 1

Details of the programme were given under Official Notices in our June 18 issue.

At the London Transport "Moving Millions" Exhibition



(Left to right) Mr. J. B. Burnell, Operating Manager (Central Road Services); Sir John Elliot, Chairman; Mr. A. A. M. Durrant, Chief Mechanical Engineer, Road Services; and Mr. B. H. Harbour, Operating Manager (Country Buses & Coaches), London Transport Executive. (See our issue of August 27)

The Special Register Information Service of the Export Services Branch, Board of Trade, reports that the Stores Department, South African Railways, is calling for tenders for:—

One complete concrete transporter comprising:—

- One power-operated wagon
- Two trailer wagons
- 600 ft. straight rail in suitable lengths complete with low level stands
- Two automatic stops
- Six curved sections with low level stands

The closing date for the receipt of tenders is September 16. Tenders must be enclosed in a sealed envelope inscribed on the outside "Tender No. F.8185: Concrete Transporter," and addressed to the Chief Stores Superintendent, P.O. Box 8617, Johannesburg.

A copy of the tender documents including specifications and conditions of contract may be obtained on loan by United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, London, W.C.1).

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the Queensland Government Railways are calling for tenders for the supply of:—

50 sheep vans
25 steel refrigerator wagons
200 steel louvered vans

It is intended that if possible the rolling stock should be constructed in Australia. While there may not be a chance of exporting the complete vehicles, United Kingdom manufacturers of component parts may have the opportunity of supplying their manufactures to the builders. It is for this reason that the inquiry is being circulated.

Tender documents and specifications (but not drawings) are being sent to the Branch and when received will be available for loan to interested firms. The closing date for the receipt of tenders is September 20.

The Special Register Information Service of the Export Services Branch, Board of Trade, reports that the Stores Department, South African Railways, is calling for tenders for 300 lever locks required for fitting to 4 in. centre pullover type catch handle locking wire operating lever frames, and not to exceed approximately 10 in. in size measured in the direction of the tappet. The locks shall be designed for operation on 10 volts d.c. and shall operate satisfactorily at 80 per cent rated volts.

The closing date for the receipt of tenders is 9 a.m. on September 30. They should be enclosed in a sealed envelope marked "Tender No. C.8187: Electrical Signalling Material (Lever Locks)" and addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg.

A copy of the tender documents including specifications and conditions of contract may be obtained on loan by United Kingdom firms on application to the Branch (Laccon House, Theobalds Road, London, W.C.1).

The Director-General of Supplies & Disposals, New Delhi, is inviting tenders as follows:—

- (a) 320 axlebox journals (b.g.), 10 in. \times 5 in.
- (b) 300 solid disc wheels, 20 in. dia. on tread
- (c) 400 screw couplings with handle complete

Tenders are to be submitted to the Director-General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting references:—

- (a) SRI/2538—E/I
- (b) SRIA/16668—E/I
- (c) SRI/16689—E/IV

They will be received up to 10 a.m. on:—

- (a) September 15
- (b) September 16
- (c) September 20

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" Branch. The drawings for (a) and (c) can be seen at the offices of Hodges Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained at a fixed price per sheet. A copy of the drawing for (b) is available only from the

Deputy Director-General (Supplies), Directorate-General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Bombay or Calcutta; Deputy Director of Supplies & Disposals, Madras. Forms of tender for (a), (b) and (c) are available for purchase in India from these officers.

Notes and News

Vacancies for Draughtsmen.—Draughtsmen of senior status are required, one for railway carriage design and one for locomotive designs. A similar type of experience is necessary. See Official Notices on page 280.

Workshop Supervisor Required.—Applications are invited for the post of workshop supervisor, diesel-electric and electrical, required by the Railway Department Gold Coast Local Civil Service for two tours of 15 to 18 months each. See Official Notices on page 280.

Vacancies for Quantity Surveyor, Site Agents and Foremen.—Applications are invited for the posts of quantity surveyor/estimator, site agents and foremen, required by the Eagle Construction Co. Ltd., Scunthorpe, Lincs. See Official Notices on page 280.

New Control Room at Woking.—In the editorial comment on the new control room at Woking in our issue of August 27 it was stated that the room was arranged "in similar style to those of the other Southern Region London Districts at Waterloo, Redhill, and Orpington." The control room at Waterloo is in fact a Head, not a District, office.

Southend-Calais Vehicle Air Ferry.—A new vehicle air ferry operated by Air Charter was due to start between Southend Airport and Calais last Wednesday; it is designed to reduce transit time between the North of England and London and the Continent. Single fares for motor-cars are stated to vary between £7 5s. and £18 according to overall length, the return fares being double the single; passenger fares are £2 16s. single and £5 1s. return.

Railway Dramatic Society's 21st Birthday.—To celebrate its coming of age, British Railways, London Midland Region (London) Dramatic Society, will present "The Sport of Kings" at the Fortune Theatre, London, on November 4, 5 and 6. Many founder members will be in the cast on this occasion, but two of the originals who had parts in the first play ever to be produced by the Society, Norman Ogden and Bill Read, will have important parts in the forthcoming show.

Blackpool Illuminations Excursions.—The North Eastern Region of British Railways is to introduce a new weekend reduced fare ticket from principal stations to Blackpool and Morecambe during the period of the illuminations (Blackpool September 10 to October 23, Morecambe September 10 to October 16). Tickets, available by ordinary trains on normal routes, may be obtained for the outward journey on Friday or Saturday, and are available for return on Sunday or Monday following the date of issue. An innovation for the benefit of other than week-end travellers visiting the illuminations is a series of mid-week excursions at specially low fares, leaving selected towns in the afternoon. There will be

afternoon excursions to Blackpool from all main West Riding towns, also from Hull and York; and to Morecambe from Leeds and Bradford.

Names for British Railways Standard Locomotives.—In British Railways programme for standard locomotives to be built during 1954 and 1955, five class "7" and 10 class "6" locomotives have been allocated to the Scottish Region. The five class "7" 4-6-2 engines bear the names of the Firths of Clyde, Forth, and Tay, and of the Dornoch and Moray Firths. The 10 class "6" 4-6-2s are named after clans Colquhoun, Graham, MacDougall, MacLean, Douglas, Gordon, Hamilton, Kennedy, Lindsay, and Scott.

Road Accidents in June and July.—Casualties from road accidents in Great Britain in July are given provisionally as 412 fatal, 5,531 serious, and 17,550 slight. The number killed is 18 less than in July, 1953, and there is a decrease in the number seriously injured. Slight injuries were 771 more than in July last year, making an overall casualty increase of 3 per cent. Final figures for June give 369 fatal casualties, 5,143 seriously injured, and 15,815 slightly injured. The corresponding figures for June, 1953, were 411, 5,084 and 15,115.

Vickers Limited Issues.—The board of Vickers Limited have announced plans to make an issue of £6,000,000 4 per cent unsecured loan stock, 1962-69, at 98½, to stock and debenture holders registered on August 12, and a rights issue of 3,078,871 £1 ordinary shares at 27s. 6d. to ordinary stockholders of that date on a basis of one share for every eight held. The new ordinary shares will not participate in the interim dividend anticipated in October. The interim will be 2½ per cent on the ordinary stock as doubled by capitalisation of reserves earlier this year. Much of the £14,000,000 received from the sale of the English Steel Corporation compensation stocks has now been used for expansion and development. Additional capital is required following the expenditure of £7,500,000 in buying back 75 per cent of the reorganised equity of the English Steel Corporation.

Hackbridge Cable Holdings Limited.—The board of Hackbridge Cable Holdings Limited propose a final ordinary dividend of 12½ per cent, making 20 per cent for the year ended March 31 last. This is the same as for last year. Consolidated trading profits fell to £247,401 (£403,354) after depreciation of £47,849 (£50,190). Taxation required £135,544 (£246,047). Net profits were £111,857 (£157,307). Current assets totalled £1,035,394 (£1,178,049), and current liabilities and provisions £498,361 (£598,527). The Chairman states that improvements and additions to plant have been made at a cost of £64,700. Trading since the end of the year has been at a satisfactory level and results are expected to be favourable.

A.C.F. Industries Incorporated.—At the annual meeting of A.C.F. Industries Incorporated, on August 27, Mr. John E. Rovensky, the retiring Chairman said that the value of the company's orders on hand was about \$112,000,000. The consolidated net profit for the first quarter of the present fiscal year amounted to \$1,839,225, from sales of \$36,308,000. Earnings were adversely affected by the lack of wagon and heavy Ordnance business and continued development work on the Talgo train.

Although, said the Chairman, there were some wagon inquiries and more passenger coach inquiries at present, the first six months of the fiscal year would not be improved by receipt of large orders at this time. They could, however, have an excellent second six months if wagon orders in particular could be obtained promptly.

Train Collides with Milk Lorry.—The 4.55 a.m. Fishguard-Paddington train came into collision with a lorry loaded with milk churns at a level crossing at Llangennech (Carmarthenshire) on August 25. The driver of the lorry succeeded in attracting attention in time for the train to be braked but not stopped. The lorry was carried for some distance along the track and there was a delay while the engine was changed and the track cleared. The train reached London two hours late. There were no casualties.

Silentbloc Limited Dividend.—The directors of Silentbloc Limited recommend a final dividend for the year ended May 31 last of 2½d. a 2s. share, making 5d. a share for the year. This dividend is the same as that for 1952-53. Consolidated net profits for the year were £69,252 (£60,051) after deduction of tax amounting to £103,771 (£103,946). A sum of £25,044 (£20,000) has been placed to reserve and £49,502 (£43,106) carried forward.

National Committee on Road Transport Education.—The eighth annual report of the National Committee on Road Transport Education, which covers the year 1953, restates the purpose of the scheme of study which the committee promotes jointly with the Royal Society of Arts, and explains the arrangements for students made to suit the special conditions of the road transport industry. Copies of the report and additional information may be obtained from the Hon. Secretary, Mr. J. C. L. Palmer, c/o Recruitment & Training Officer, London Transport Executive, 55, Broadway, London, S.W.1.

Eastern Region Carriage Panel Pictures.—The water colour of Stowmarket Station, on the Ipswich-Norwich main line, reproduced on this page, is one of four carriage pictures produced under the direction of the Public Relations & Publicity Officer,

Eastern Region. The other three water colours depict the Colne Valley Viaduct at Chappel, Essex; Ufford church, near Milton, Suffolk; and the village street at Sible Hedingham, Essex.

Closure of U.T.A. Stations.—The Ulster Transport Authority announces that as from September 20 seven stations on the Belfast-Londonderry line will be closed. They are Whitehouse, Mossley, Templepatrick, Dunadry, Macfin, Ballykelly, and Carrichue.

East Indian Railway Annual Dinner.—The 51st annual dinner of the East Indian Railway Officers' Association will be held at the Connaught Rooms, Great Queen Street, London, W.C.2, on Wednesday, September 22, at 6.30 for 7 p.m. The chair will be taken by Mr. F. G. S. Martin. Tickets, price 21s. each, for members and their guests, may be obtained on application to Mr. R. C. Harvey, Hon. Secretary of the Association, Aros Shona, Copthorne, Sussex. The dinner will be followed on Thursday, September 23, by the annual tea party for members, their wives, families and guests, at St. Ermins Hotel, Caxton Street, Westminster, S.W.1, from 3.30 to 6 p.m. The inclusive charge for one ticket will be 7s. and additional tickets 6s. 6d. each, and can be obtained from Mrs. Mona Cambridge, Harringford House, Luccombe Road, Shanklin, I. of. W.

British Railways Inter-Regional Cricket Championship.—In the final of the British Railways Staff Association inter-Regional cricket championship, played on the Southern Region ground at Raynes Park on August 26, the North Eastern Region team was successful against the London Midland Region team, winning by 138 runs to 70. After the game Sir Brian Robertson, Chairman of the British Transport Commission, presented the Mitchell-Hedges trophy to H. Laidler, player's assistant, North Road Works, Darlington, captain of the North Eastern team, and congratulated both teams on their excellent performances with particular reference to the batting of Phil Dalby, of the North Eastern, and R. Brewin, captain of the London Midland team. He also presented the ball to W. Jackson, of the North Eastern Region, in recognition

of his hat trick; this player bowled throughout the innings to finish with 7 wickets for 33 runs.

International Nickel Company of Canada Limited.—The interim financial statement of the International Nickel Company of Canada Limited for the six months ended June 30, shows net earnings, in terms of U.S. currency, of \$32,586,185. For the corresponding months of 1953, net earnings were \$29,205,595. In a message to the shareholders, Dr. J. F. Thompson, chairman of the company, draws attention to the promise for the future of the electronics industry and the employment of nickel in connection with electronics. More than 7,000,000 lb. of nickel was supplied to this industry in the past year.

City of London College Courses in Transport.—The 1954-55 session of the City of London College includes classes, at moderate fees, in transport, economics, and kindred subjects. Classes will be held in preparation for the Institute of Transport graduateship and associate membership examinations. Other students interested in transport, but who do not necessarily wish to take the examinations, also will be welcomed. Lectures are given weekly. Enrolment may be made on September 20 (last session's students only), 21, and 22, from 5 to 8 p.m. each evening. Particulars are available from the City of London College, Moorgate, London, E.C.2.

Welding Design Course in Manchester.—Courses on welding design, with particular reference to structural work, have been held by the Quasi-Arc Co. Ltd. during the past few years in various parts of the country. They are arranged to assist design and drawing office staff in turning over from riveting and casting designs to welding, and the instruction concentrates on the practical factors involved in designing welded structures, and the efficient detailing of all types of welded structural components. This winter, the centres selected for courses are Manchester, London, Cardiff, and Bilston, the first three courses being in the form of a series of evening lectures, and the final one a full time one week course. The Manchester course will commence on October 13, 1954, at the Engineers' Club, 17, Albert Square.



Carriage panel picture of Stowmarket Station, produced by the Eastern Region and one of a new series of four

and the lectures will be held every Wednesday and Thursday evening over a period of seven weeks. Further details can be obtained from the Constructional Design Department, the Quasi-Arc Co. Ltd., Bilston, Staffs.

Renold Chains Limited.—The name of the Renold & Coventry Chain Co. Ltd. has been changed to Renold Chains Limited. At the same time the name of the company's British subsidiary which has branches on the Continent has been changed from Renold Chains Limited to Renold Chains Continental Limited.

Withdrawal of Passenger Train Service from Cromer High.—British Railways, Eastern Region, announce that on and from September 20, Cromer High Station will be closed to passenger train traffic. Alternative facilities for passenger and parcels traffic will be available at Cromer Beach.

London-Midland Athletic Championship Meeting.—The Staff Association of British Railways, London Midland Region, held its first annual championship athletic meeting at Headstone Lane, near Harrow, on August 21. There were some close finishes and some notable achievements. The tug-of-war championship went to Rugby Motive Power Depot.

Powers - Samas Accounting Machines Limited.—Powers - Samas Accounting Machines Limited is making arrangements to take over additional production capacity from Vickers-Armstrongs Limited. To deal with the increased scope of the business, Mr. R. Wonfor has been appointed Managing Director (Sales, Finance, & Research), and Mr. T. R. Swift Managing Director (Production).

Metropolitan-Vickers Exhibits at Scottish Industries Exhibition.—The Scottish Industries Exhibition being held in the Kelvin Hall, Glasgow, on September 2-18, and Metropolitan-Vickers Electrical Co. Ltd. will exhibit a range of products of the company's Germiston and Motherwell factories. The equipment includes air coolers, oil coolers, vertically-isolated switchgear type VH, and a variety of types of Sunvic controls, meters, relays, and so on. A Metropolitan-Vickers atomic hydrogen welding set will be demonstrated. Metropolitan-Vickers and Newton Victor have supplied equipment for display at the Research in Industry Exhibition being held in the Glasgow Art Gallery from August 30 to September 18. The equipment includes electron microscope EM4, a Raymax 60 X-ray diffraction unit, a Raymax 250 industrial X-ray unit, and the Victrometer portable electrometer.

Industrial Smoke Indicator.—Radiovisor Parent Limited has evolved an industrial smoke indicator, the Radiovisor, which means the density of smoke in a flue uptake is known before it reaches the top of the stack. The apparatus consists of a projector, receiver, and control unit with an external indicator, recorder or alarm. The equipment is suitable for standard a.c. voltage of 200-250 V., 50 cycles; d.c. apparatus can also be supplied. In operation, a beam of light from the projector is thrown across the base of the uptake and directed upon the receiver containing the light sensitive cell. The amplified central panel is connected to the receiver, and leads from the central panel are taken to the indicator, which is calibrated in Ringelmann smoke units. The apparatus

is designed for a projection-receiver separation of 30 ft. Continuous chart recorders also are available.

"Road Train" for Transport of Cattle.—Mr. John Vestey, a member of the British meat combine who are the largest property-holders in the Northern Territory of Australia, is reported to have said that "road trains" with at least two trailers would be a thing of the future. More than 1,000 cattle had been taken from near Newcastle Waters to Mount Isa in Queensland in six weeks by a road train bought by his company.

Specialloid Limited.—In his statement circulated with the accounts for the year ended April 3 last, Mr. D. I. Ball, Chairman of Specialloid Limited, explains that the trade recession continued into the first half of 1953, and despite economies, the improved trading towards the end of the year was insufficient to recover in full the relatively heavy overheads due to the earlier reduced operations. Turnover for the last quarter was some 43 per cent greater than that for the first two quarters. The increased activity has persisted, and trading results for the first quarter of the current year have been profitable. Financial results were given in our issue of August 20.

Sankey's Fire Cements.—A fire cement for furnaces, regenerators and cupolas able to withstand intermittent heat up to 1,580 deg. C. is produced by J. H. Sankey & Son Ltd., Refractories Works, Ilford. The material, known as Pyruma, is produced in six grades, and is suitable for various purposes, such as filling, for monolithic linings, patching, spraying and so on. Also produced is a plastic fire cement, known as Aluma, for temperatures up to

1,800 deg. C., and specially suitable for severe conditions caused by flame impingement; and is recommended for linings in furnaces fired by oil or pulverised fuel. Siluma, another product of the firm, is specially prepared for hot patching of fireclay, semi-silica, and silica walls, as in gas retorts and coke oven walls. An illustrated leaflet giving particulars of the materials is available on application, free of charge.

Davey, Paxman & Co. Ltd. London Office.—Davey, Paxman & Co. Ltd., Colchester, have moved their London office from 95, Aldwych, W.C.2, to 1, Balfour Place, Mount Street, W.1. The manager is Mr. A. C. Parker, and the telephone number is Gro. 6114/5.

G. A. Harvey Exhibits at Baghdad.—In conjunction with their local agents, G. A. Harvey & Co. (London) Ltd. will exhibit at the forthcoming British Trade Fair, Baghdad, a representative range of steel office equipment. Of special interest will be the new features incorporated in their filing cabinets which include ball bearing suspension arms, check action to hold drawers in closed position, extra filing space, and so on. Specimens of perforated metals, woven wire cloth, and wirework will also be displayed, indicating the versatility of the firm's products. Items of equipment such as fractionating columns weighing some 220 tons, gas oil separators made from 3-in. thick mild steel plate, turbine casings, cement drying kilns and other types of equipment representing the firm's heavier products will be portrayed by illustrations.

Mercast (Great Britain) Limited.—Guest, Keen & Nettlefolds Limited, and the Mercast Corporation, New York, U.S.A.,

"Quick Check" Oil Dispenser



C. C. Wakefield & Co. Ltd. "Quick Check" lubricating oil dispenser in use at the St. Pancras road motor depot of the London Midland Region (see paragraph in our August 20 issue)

have formed a company, Mercast (Great Britain) Limited, Albert Street, Bilston, Staffordshire, to license firms in the United Kingdom and the British Commonwealth, excluding Canada, to use the Mercast process, a method of investment casting, in which patterns of frozen mercury replace wax patterns. The chairman of the new company is Mr. G. R. Sankey.

South African Rates Increase not to be Deferred.—The South African Minister of Transport has turned down a request by the Federated Chamber of Industries that the introduction of new railway rates be postponed for a further period beyond September 1. The new rates were the subject of an editorial note in our July 23 issue.

Railway Stock Market

Active conditions and strongly rising prices ruled in stock markets with buyers again predominating and the rise in values tending to be accelerated owing to shortage of stock in the market. Investors still show little disposition to take the big profits represented by the appreciation in their holdings during the past few months. Many argue that there is little point in selling and switching into other securities showing a larger yield and which may now have greater scope for capital appreciation. There are the expenses of making an exchange of this kind; and with markets in their present optimistic condition, the rise in prices still seems indiscriminate, and shares which have already shown a substantial advance are still moving in favour of holders.

The upwards swing cannot continue indefinitely, however, and sooner or later, buying will become much more selective and concentrate on shares which still offer reasonable yields and seem relatively undervalued. There is no doubt that sentiment continues to be stimulated by the hope that the authorities favour a cheaper money policy and that before long the bank rate may be reduced further to 2½ per cent.

Foreign rails still attract only moderate attention, though there is no doubt there are still stocks in this section which offer good scope for capital appreciation for the investor willing if necessary to look ahead.

Dorad Railway ordinary stock, for example, has now improved to the 85 level. The break-up value is well over this, and one day there may be a take-over offer.

There is no doubt that the break-up values of Antofagasta ordinary and preference stocks are well above their current market prices of 8½ and 42½ respectively. In this case also a take-over offer may be a possibility for the future.

The same applies to Costa Rica Railway ordinary stock, now up to 11, while the 6½ per cent first debentures at 67½ and the 6½ per cent second debentures at 55½ may not be without further good scope for capital appreciation for the investor willing to look ahead.

Because of future possibilities of much bigger earnings for the railway, White Pass no par value shares seem likely to attract a good deal of attention from time to time, though they will probably continue to fluctuate a good deal. They are now priced at \$31½, and have been up to

\$35½ and down to \$24 earlier this year. The 5 per cent convertible debentures, although they must be expected to fluctuate with the shares, are an interesting investment cum speculation, though in recent weeks they have come back from £115 to £110.

Canadian Pacific at \$47½ are regarded as one of the best ways an investor can participate in the future of the Dominion. Moreover, the yield of 5½ per cent at the current price cannot be classed as unattractive these days.

Speculative activity is less in evidence in Midland of Western Australia, which at 25 have lost part of their recent advance.

Elsewhere, buyers have again been coming in for Nyasaland Railway £1 ordinary stock on its future possibilities. At 5s. 9d. the price has held its recent rise.

This week United of Havana second income stock has eased to 35½ and the consolidated stock declined to 5. Nitrate Rails shares were 20s. 3d. and Taltal Railway shares 13s. 6d. Paraguay Central 6 per cent debentures were 20½. Mexican Central 4 per cent "A" debentures were 73.

Road transport shares have continued in demand, but buyers found that in many cases they were firmly held and often not easy to obtain in any amount at prices indicated by current quotations in the Stock Exchange lists. Among shares in this section with the most active market, Southdown were 35s. 3d., West Riding 35s., and Lancashire Transport 60s. B.E.T. deferred "A" 5s. units remained active at the higher level of 63s. 6d.

Engineering and kindred shares again attracted more attention. Vickers at 41s. 6d. have advanced on the new issue terms. Tube Investments were more active around 70s., while Guest Keen have been influenced by higher dividend hopes and at 64s. 3d. held an earlier rise.

Among shares of locomotive builders and engineers, Vulcan Foundry were 31s. Beyer Peacock have been more active around 46s. 9d., while Birmingham Carriages were 27s., and G. D. Peters 22s. 3d. Gloucester Wagon 10s. shares were up to 21s. 3d., North British Locomotive 16s., Hurst Nelson 42s., and Charles Roberts 5s. shares 9s. 9d. Wagon Repairs 5s. shares were 13s. 6d.

Forthcoming Meetings

September 3 (Fri.).—The Railway Club, at 57, Fetter Lane, London, E.C.4, at 7 p.m. Paper entitled "The Bexley Heath Railway," by Mr. E. A. Course.

September 6 (Mon.). to September 14 (Tue.).—Institute of Metals; Forty-sixth Annual Autumn Meeting in Switzerland.

September 7 (Tue.).—Permanent Way Institution, Leeds & Bradford Section, at British Railways Social and Recreational Club, Ellis Court, Leeds City North Station, at 7 p.m. Paper on "Permanent Way 'Mechanical Muscles' in use on British Railways," illustrated by lantern slides, by Mr. R. C. Mose-dale, Senior Technical Assistant to District Engineer, Leeds, N.E.R.

September 10 (Fri.).—Locomotive Society of Scotland, at 302, Buchanan Street, Glasgow, C.2, at 7.15 for 7.30 p.m. Paper entitled "G.W.R. Reminiscences," by Mr. John Drayton.

September 17 (Fri.) to September 20 (Mon.).—The Bonar Law Memorial College, Berkhamsted, Herts, in conjunction with the Institute of Transport: Weekend course on "Transport" at Ashridge.

September 18 (Sat.).—Permanent Way Institution, London Section: Visit to Longmoor Military Railway, Hants.

September 22 (Wed.).—Locomotive Society of Scotland, at 302, Buchanan Street, Glasgow, C.2, at 7.15 for 7.30 p.m. Paper on "The Locomotive Trials in Relation to British Standard Locomotives," by Mr. Alfred Oliver.

September 22 (Wed.).—East Indian Railway Officers' Association Annual Dinner at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2, at 6.30 for 7 p.m.

Until September 25 (Sat.).—"Popular Carriage" Exhibition (Two centuries of carriage design for road and rail) in the Shareholders' Meeting Room, Euston Station, London, N.W.1. Weekdays 10 a.m. to 7 p.m.; Sundays 2 to 7 p.m.

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

QUANTITY SURVEYOR/ESTIMATOR required. Permanent position with accommodation offered to suitably qualified man. Apply to The Eagle Construction Co., Ltd., Scunthorpe, Lincs.

COMPETENT Site Agents and Foremen required, must be fully conversant with Railroad construction. Good pay and prospects for the right men. Apply: The Eagle Construction Co., Ltd., Scunthorpe, Lincs.

DRAUGHTSMEN of Senior status required. One for Railway Carriage design and one for Locomotive designs. A similar type of experience is necessary. The positions are permanent and progressive with commencing salaries up to £700 per annum. Offices are situated in Victoria Street, London. Write brief details quoting reference 22 to Box 335, The Railway Gazette, 33, Tothill Street, London, S.W.1.

ELECTRICAL DESIGNER of traction motors and generators required for work in connection with diesel electric traction. Candidates should have good academic attainments together with wide experience of the electrical and mechanical design of traction machines and the manufacturing techniques associated with these machines. Applications giving full details of qualifications, experience, etc., should be addressed to the Chief Personnel Officer, Brush Electrical Engineering Co., Ltd., Loughborough, Leics.

WORKSHOP SUPERVISOR (Diesel-electric and Electrical) required by Railway Department, Gold Coast Local Civil Service for one tour of 18/24 months. Consolidated salary in scale £980 rising to £1,230 a year. Gratuity at the rate of £100/£150 a year. Outfit allowance £60. Free passages. Liberal leave on full salary. Candidates must have served an apprenticeship, preferably on heavy diesel-electric sets, and must have an adequate knowledge of Alternators and D.C. motors. They must possess O.N.C. in Mechanical or Electrical Engineering, be able to read and understand drawings and electrical wiring diagrams and have experience of maintenance in Workshops where H.T. current is used. Experience of the running maintenance of diesel-electric sets is most desirable. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/40406/RA.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.